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Bu sayımızda obstetri alanında 7, jinekoloji ve onkoloji alanlarında 7, infertilte ve neonataloji alanlarında 1'er orjinal araştırma makalesi olmak üzere toplam 17 adet bilimsel makale yer almaktadır. Dergimize yayınlanması amacıyla bilimsel çalışmalarını göndererek katkı sunan tüm araştırmacılara ve hakemlik görevi üstlenen meslekdaşlarımıza öncelikle teşekkürlerimizi sunarız.

Bir sonraki sayımızda buluşmak dileğiyle...

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Comparison of composite adverse perinatal outcomes in early- and late-onset intrahepatic cholestasis of pregnancy

Erken ve geç başlangıçlı intra hepatic gebelik kolestazında kompozit olumsuz perinatal sonuçların karşılaştırılması

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ABSTRACT

Aim: To compare composite adverse perinatal outcomes (CAPO) in women with early- and late-onset intrahepatic cholestasis of pregnancy (ICP).

Materials and Methods: This study was designed as a single-center, retrospective study in a tertiary hospital and included a total of 198 patients with ICP, including 36 patients with early-onset ICP (EO-ICP) and 162 patients with late-onset ICP (LO-ICP). ICP that developed before the 28thweek of gestation was defined as EO-ICP, and ICP that occurred after the 28thweek of gestationwas defined as LO-ICP. The existence of at least one of the following criteria was defined as CAPO: umbilical cord arterial pH < 7.20, fifth-minute Apgar score < 5, andneonatal intensivecarestay of>24 hours.

Results: The rates of spontaneous preterm birth and neonatal intensive care admission were statistically significantly higher in the EO-ICP group (p<0.001). In the same group, a significantly higher number of neonates were born with meconium (p=0.040). The use of ursodeoxycholic acid was significantly greater in the EO-ICP group (p=0.007). The two groups did not show any significant differences in terms of neonatal umbilical cord arterial pH or base excess (p>0.05), however, the CAPO rate was significantly higher in the EO-ICP group(p=0.028). Receiver operator characteristic analysis revealed an optimal cut-off value of 33.5 µmol/L for the serum bile acid level, at which this parameter had 74% sensitivity and 68% specificity (area under the curve=0.759; p<0.001) in the prediction of CAPO.

Conclusion: We consider that the high CAPO rates in the fetuses of patients with EO-ICP are due to the effect of high serum bile acid levels on the fetus for a longer time than in the LO-ICP group. The differentiation of cases of EO-ICP and LO-ICP will serve as a guide for clinicians in predicting possible complications.

Keywords: Adverse perinatal outcomes; intrahepatic cholestasis of pregnancy, serum bile acid

ÖZ

Amaç: Bu çalışmanın amacı erken ve geç başlangıçlı intrahepatik gebelik kolestazı olan kadınlarda kompozit olumsuz perinatal sonuçları karşılaştırmaktı.

Gereç ve Yöntemler: Bu çalışma, üçüncü basamak bir hastanede tek merkezli, retrospektif bir çalışma olarak tasarlandıve 36 erken-başlangıçlı intrahepatik gebelik kolestazı (EB-IGK) ve 162 geç başlangıçlı intrahepatik gebelik kolestazı (GB-IGK) hastası olmak üzere toplam 198 IGK hastasını içeriyordu. Gebeliğin 28. Haftasından once gelişen IGK, EB-IGK olarak, 28. Gebelik haftasından sonra gelişen IGK ise GB-IGK olarak tanımlandı. Aşağıdaki kriterlerden en az birinin varlığı kompozit olumsuz perinatal sonuç olarak tanımlandı: umblikal kord arteriyel pH'ı<7,20, 5.dakika Apgar skoru<5 ve >24 saat yenidoğan yoğunbakımda kalış.

Bulgular: EB-IGK grubunda spontan erken doğum ve yenidoğan yoğun bakıma başvuru oranları istatistiksel olarak anlamlı derecede yüksekti (p<0,001). Aynı grupta anlamlı olarak daha yüksek sayıda mekonyumlu yenidoğan doğdu (p=0,040). Ursodeoksikolikasit kullanımı EB-IGK grubunda anlamlı olarak daha fazlaydı (p=0,007). Umbilikal kord arteriyel pH'I ve baz açığı açısından iki grup arasında anlamlı bir fark görülmezken, EB-IGK grubunda kompozit olumsuz perinatal sonuç oranı anlamlı olarak daha yüksekti (p=0,028). ROC analizinde, kompozit olumsuz perinatal sonuç öngörüsü için, serum safra asidi düzeyinin optimal kesme değeri %74 duyarlılık ve %68 özgüllük ile 33,5 µmol/L saptandı (Eğri altında kalan alan=0,759; p<0,001).

Sonuç: Erken başlangıçlı IGK hastalarının fetuslarında kompozit olumsuz perinatal sonuç oranlarının yüksek olmasını yüksek SBA düzeyinin geç başlangıçlı hasta grubuna kıyasla daha uzun sure fetus üzerine etkisinden kaynaklandığını savunmaktayız. EB-IGK ve GB-IGK vakalarının ayrımı, olası komplikasyonları öngörmede klinisyenlere yol gösterici olacaktır.

Anahtar Kelimeler: İntrahepatik gebelik kolestazı, olumsuz perinatal sonuç, serum safra asiti

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INTRODUCTION

Intrahepatic cholestasis of pregnancy (ICP) is a disease that usually begins with pruritus of the palms and soles, accompanied by elevated serum bile acid (SBA) levels, and can have adverse perinatal outcomes (1). It occurs in the second or third trimester of pregnancy and continues with itching without lesions (2). Although the prevalence of ICP varies in the literature according to the country and population, the common consensus is that this rate ranges between 0.3 and 1.5% (3-5).

The diagnosis of ICP is made by taking a detailed history of the patient, including the duration of itching, evaluating the presence of skin lesions, and, if necessary, measuring the SBA value and determining whether it is above 10 µmol/L (6). Routine liver function tests and screening for viral hepatitis are not effective for diagnosis (1, 6). It has been proven that ICP causes fetal death due to sudden fetal arrhythmia and placental vasospasm resulting from increased bile acid and that there is an elevated sensitivity of oxytocin receptors in these patients, which contributes to an increased likelihood of spontaneous preterm birth and the presence of meconium in the amniotic fluid at term (7). It has been reported that adverse perinatal outcomes in ICP are associated with increased bile acid levelsrather than the deterioration of liver function (8, 9). Depending on the bile acid level, ICP is defined as mild (10-39 µmol/L), moderate (39-99 µmol/L), or severe (>100 µmol/L) (6). As the severity of ICP increases, the incidence of perinatal adverse outcomes also increases (10). This has been substantiated by several studies (11). As a result, it has been suggested that the management and birth weeks of patients diagnosed with ICP should be individualized (1, 12).

Patients diagnosed with ICP may be affected by the onset of the disease, which can potentially impact perinatal outcomes, and patient management should be evaluated by taking into consideration the possibility of this effect.To the best of our knowledge, there is only one study in the existing research that examines the impact of ICP on adverse prenatal outcomes based on the timing of disease onset (13). In the current study, our aim was to reveal the relationship between the week of onset of ICP and composite adverse perinatal outcomes (CAPO), as well as to determine whether early or late onset of the disease increasedthese negative outcomes.

MATERIAL AND METHOD

This study was designed as a retrospective, single-center study. Patients aged 18-45 who were followed up and treated with the diagnosis of ICP at the High-Risk Pregnancies Department of Ankara City Hospital from June 2019 to October 2023 were included in the study. The study obtained approval from the hospital's ethics committee (E2-23-5175). Every stage of the study adhered to the provisions of the Declaration of Helsinki.

The patients' data were accessed from the hospital database. For each patient included in the study, clinicodemographic information, age, parity, gravida, number of miscarriages, body mass index, week of gestation at which the disease started, pregnancy complications, any medication use, ICP severity, SBA value, routine liver function test results at diagnosis, gestational week at birth, newborn birth weight, first- and fifth-minute Apgar scores, newborn umbilical cord arterialpH and base excess (BE), and whether the newborn was admitted to the neonatal intensive care unit (NICU) were recorded.

The study included patients who experienced pruritus originating from the palms and soles of the feet and spreading throughout the body during pregnancy, accompanied by an SBA level above 10 µmol/L (1, 14). ICP that developed at or before the 28th week of gestation was considered early-onset ICP (EO-ICP), and ICP that occurred after the 28th week of gestation was considered late-onset ICP (LO-ICP). Patients with SBA levels of 10-40 µmol/L were considered to have mild ICP, and those with SBA levels above 40 µmol/L were considered to have severe ICP. The referenceranges of the measured laboratory values were as follows: SBA0–10 µmol/L; alanineaminotransferase, 0–35 U/L; aspartateaminotransferase, 0–35 U/L; alkalinephosphatase, 50–136 U/L; gamma-glutamyl transpeptidase, 0–38 U/L; total bilirubin, 5–21 µmol/L; and direct bilirubin, 0–7 µmol/L.

Multiple pregnancies, patients with organ transplants, those with immune deficiency, hypertensive patients, pregnant women with active or chronic viral hepatitis and autoimmune hepatitis, those with known major fetal chromosomal and structural anomalies, and those with missing or unavailable data were excluded from the study.

CAPO was determined by the presence of at least one of the following criteria: umbilical arterial pH below 7.20, fifth-minute Apgar score below 5, and a stay in NICU for more than 24 hours.

STATISTICAL ANALYSIS

SPSS version 22.0 (SPSS Inc., Chicago, IL, USA) statistical program was used for data analysis. The Kolmogorov–Smirnov and Shapiro–Wilk tests were conducted to analyze the suitability of the data for the normal distribution. The Student'st-test and the Mann-

Whitney U test were employed to compare normally and non-normally distributed variables, respectively. Descriptive analyses were presented using means and standard deviations for normally distributed variables and median and interquartile range values for non-normally distributed variables. The chi-square test was used to compare categorical variables. Areceiver operating characteristic (ROC)analysis was undertaken to determine the cut-off value of SBA in predicting CAPO. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included a total of 198 patients diagnosed with ICP, of whom 36 were in the EO-ICP group, and 162 were in the LO-ICP group. Table 1 presents the comparison of clinicodemographic data, gestational week at the time of ICP diagnosis, gestational week at birth, neonatal birth weight, neonatal first- and fifth-minute Apgar scores, maternal liver function test results, and SBA levels between the two groups. There were statistically significant differences between these groups in terms of gestational week atdiagnosis, neonatal birth weight, and neonatalfirst-minute Apgar score.

Table 2 shows the results related to disease severity, ursodeoxycholic acid (UCDA) use, pregnancy complications, the presence of meconium staining amnion, neonatal umbilical cord arterial pH and BE, NICU admission, and CAPO rates in both groups.The rates of spontaneous preterm birth, severe ICP, meconium-stained delivery, and NICU admission were statistically significantly higher in the group of EO-ICP. There were no significant differencesamong the two groups regarding neonatal umbilical cord arterialpH or BE. The rate of CAPO statistically significantly differed amongthe two groups (p=0.028). There was no intrauterine fetal loss in both groups during the antenatal period.

As a result of ROC analysis, the optimal cut-off value of the SBA level in predicting CAPO was determined to be 33.5 µmol/L, at which it had 74% sensitivity and 68% specificity (area under the curve =0.759; p<0.001) (Table 3) (Figure1).

Table 1. Comparison of clinicodemographic and obstetric data between the studygroups

Variables	EO-ICP group (n=36)	LO-ICP group (n=162)	*p*-value
Age (years)	28.9 (8)	28.8 (9)	0.854
Gravida (n)	1.8 (1)	2.3 (2)	0.434
Parity (n)	0.5 (1)	0.9 (2)	0.365
Miscarriage (n)	0.2 (0)	0.4 (1)	0.504
Body mass index (kg/m^2)	28.0 (4)	26.9 (4)	0.431
Gestational week at diagnosis	26.2 (2)	34.3 (3)	0.000
Gestational week at birth	36.3 (0)	36.5 (1)	0.953
Neonatal birth weight (gram)	2640.1 (320)	2856.2 (465)	0.000
First-minute Apgar score	7.1 (1)	7.4 (1)	0.002
Fifth-minute Apgar score	8.7 (1)	8.9 (0)	0.083
Bile acid level (µmol/L)	41.8 (31)	27.0 (12)	0.045
ALT (U/L)	76.3 ± 32.5	74.7 ± 34.5	0.687
AST (U/L)	67.8 ± 26.8	66.9 ± 29.6	0.569
GGT (U/L)	40.4 ± 13.8	39.3 ± 16.3	0.432
ALP (U/L)	186.3 ± 89.4	179.6 ± 88.2	0.278
Total bilirubin (mg/dL)	13.6 ± 3.7	12.9 ± 4.3	0.693
Direct bilirubin (mg/dL)	4.1 ± 1.7	3.9 ± 1.9	0.576

EO-ICP: early-onset intrahepatic cholestasis of pregnancy, LO-ICP: late-onset intrahepatic cholestasis of pregnancy, ALT: alanine aminotransferase, AST: aspartate aminotransferase, GGT: gamma-glutamyl transpeptidase, ALP: alkaline phosphatase
Independent-samples *t*-test and Mann-Whitney *U*-test were used.
Data expressed as mean±SD; median interquartile range
p<0.05 was considered statistically significant.

Table 2. Comparison of CAPO between the study groups

Variables	EO-ICP group (n = 36)	LO-ICP group (n = 162)	*p*-value
UCDA use	32 (88.9%)	107 (66.0%)	0.007
Severe ICP	15 (41.7%)	28 (17.3%)	0.001
NICU admission	13 (36.1%)	22 (13.6%)	0.001
Cesarean delivery	27 (75.0%)	100 (61.7%)	0.290
CAPO	9 (25%)	18 (11.1%)	0.028
Preterm birth	12 (33.3%)	15 (9.3%)	0.000
FGR	4 (11.1%)	29 (17.9%)	0.323
Meconium-stained amnion	5 (13.9%)	8 (4.9%)	0.040
Umbilical cord arterial base excess (mmol/L)	-2.9(3)	-2.4(2)	0.311
Umbilical cord arterial pH	7.2(0.1)	7.3(0.2)	0.299

CAPO, composite adverse perinatal outcomes; EO-ICP, early-onset intrahepatic cholestasis of pregnancy; FGR, fetal growth restriction; LO-ICP, late-onset intrahepatic cholestasis of pregnancy; NICU, neonatal intensive care unit; UCDA,ursodeoxycholic acid
The chi-square test and Mann-Whitney U-test were used.
Data expressed as median interquartile range, number percentage
p<0.05 was considered statistically significant.

Table 3. Predictive performance of SBA in predicting CAPO

Variable	AUC	Std. error	Asymp. Sig	%95 CI		Cut-off value
				Lower	Upper	
SBA	0.759	0.058	0.000	0.646	0.872	33.5

AUC: Area under curve, CAPO: Composite adverse perinatal outcome; SBA, serum bile acid
p<0.05 statistically significant

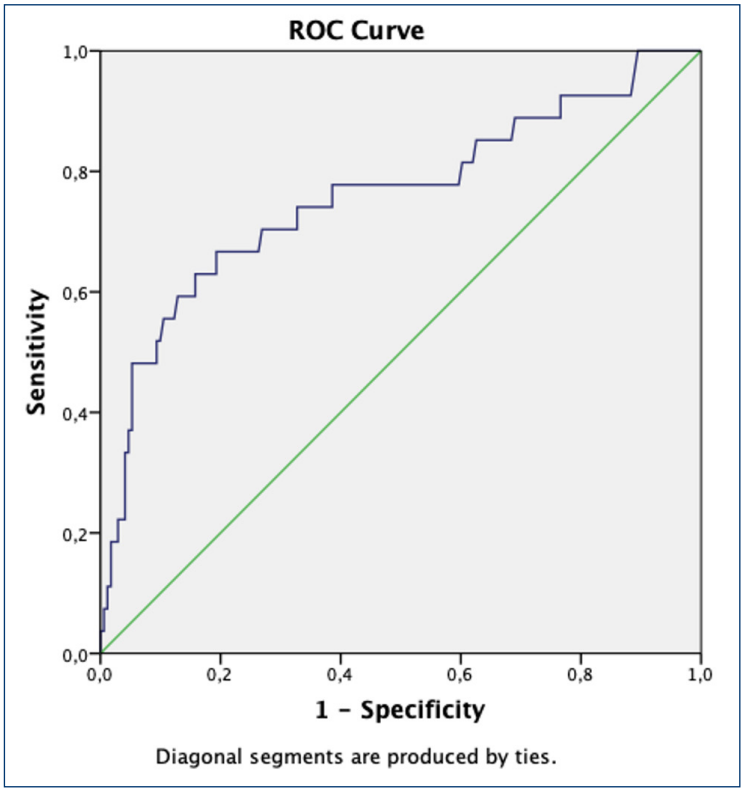

Figure 1. ROC analysis of the predictive ability serum bile acid for CAPO

DISCUSSION

This study examined the relationship between the week of onset of ICP and CAPO. We observed a statistically significant increase in the utilization of UCDA among patients in the EO-ICP group compared to the LO-ICP group, and the latter also presented with a higher number ofspontaneous preterm births and meconium-stained deliveries, lower first- and fifth-minute Apgar scores, and a higher rate of NICU admission. Consequently, the rate of CAPO was also higher in the EO-ICP group.

ICP is an obstetric complication with significant adverse perinatal consequences (15). Various theories and ideas have been proposed for the developmental mechanism of ICP and its effects on the fetus. However, it remains unclear which fetuses are at greater risk in the presence of ICP (7). Various blood markers, such as bile acid, transaminase, and other liver enzymes, have been used to predict adverse perinatal outcomes, but there is no consensus on this issue (12). There are many studies on this subject, and the prevailing idea is that the SBA mechanism is mostly likely to be responsible (8).

The pathophysiology of ICP is based on inflammatory mechanisms caused by high SBA levels (16). In a review, Majsterek et al. revealed that increased SBA levels were associated with adverse perinatal outcomes (8). In the same study, it was determined that as SBA elevation rates increased, adverse pregnancy outcomes increased proportionally (8). This idea is supported by the results of many studies conducted at different times (17).

This study found higher SBA values in the EO-ICP group than in the LO-ICP group. In proportion to the higher SBA values in the EO-ICP group, we also detected a higher rate of CAPO in this group, which is consistentwith the results of the abovementioned studies. Moreover, in the current study, at a cut-off value of 33.5 µmol/L, the SBA value had 74% sensitivity and 68% specificity in the prediction of CAPO.

Although staining of amniotic fluid with meconium is a condition that should not be observed during a normal pregnancy, it complicates 5-20% of women giving birth (18). The prevalence of this condition increases as the gestational age increases, and this rate reaches 27%, especially in post-term pregnant women (19). Amniotic fluid stained with meconium has been found to be associated with important problems in the neonatal period, including neonatal meconium aspiration syndrome, fetal acidemia, neonatal respiratory distress, and cerebral palsy (18). Grantz et al. reported that meconium staining increased up to 44% in patients with ICP, and this was in proportion to the elevation in the SBA level (20). This result was later confirmed by a meta-analysis by Ovadia et al. and a study by Çelik et al. (12, 21).

The findings of our study revealed a significantly higher incidence of meconium-stained amnion in the EO-ICP cohort than the LO-ICP cohort, which is consistent with the literature. Although the mechanism of prenatal meconium discharge in ICP remains unknown, the higher prevalence of thiscondition in patients with EO-ICP can be attributed to the fetal distress environment that occurs as a result of the toxic effect of increased SBA on the fetus for a relatively longer time compared to cases of LO-ICP, as well as the direct stimulating effect of bile acids on the intestinal muscles.

Preterm birth is an obstetric complication with adverse perinatal outcomes (22). It complicates approximately 10% of all pregnancies. It is also associated with many complications, such as increased visits to the NICU in the neonatal period, neonatal sepsis, hyperbilirubinemia, apnea, bradycardia, hypoglycemia, anemia, and necrotizing enterocolitis (23, 24).Shemer et al. found high preterm birth rates compared to the normal pregnancy group(24). In a later study, Chen et al. confirmed this result by detecting a preterm birth rate of 18.6%(11).

In this study, the rate of preterm birth was found to be three times higher in theEO-ICP group compared to theLO-ICP group(33.3% vs. 9.3%). This result supports the hypothesis that the bile acids that rise more in patients with EO-ICP compared to those with LO-ICP take longer to act and that the bile acids increasing withpreterm birth increase oxytocin receptors.

One of the cornerstones of ICP treatment is the use of UCDA (25). It is considered safe for both the fetus and the mother and has been shown to improve perinatal outcomes in many studies (25, 26). In a research conducted by Jin et al., no significant difference was seen in the use of UCDA among the EO-ICP and LO-ICP groups, the rate of patients using UCDA was significantly higher in the former (13). This was attributed to the more apparent and distressingclinical manifestation of the diseaseand the higher SBA level in the EO-ICP group.

It is common for newborns to be admitted to the NICU in the presence of ICP (27). This is considered to be due to the presence of meconium-containing amniotic fluid, spontaneous or iatrogenic premature birth, which is common in patients with ICP, and the fetal hypoxic and asphyxial environment created by placental vasospasm caused by elevated SBA levels, which negatively affect the fetus starting from the intrauterine period (28). In studies conducted with ICP cases, the average rate of NICU admission is reported to range from 17 to 38%, depending on the gestational week at birth. There are studies showing that the NICU rate can reach 60% in untreated patients or in patient groups presenting with high SBA levels (29). In this study, we found that the rate of

NICU admission was higher in the EO-ICP group compared to the LO-ICP group, which was related to various factors, including a higher rate of preterm births and meconium staining and higher maternal SBA values in this group.

In this study, CAPO rates were investigated for the first time in patients with ICP according to the onset of the disease. The rate of CAPO was shown to be significantly higher in the EO-ICP group, which is similar to the results of the only study in the literature that investigated the adverse perinatal outcomes of patients (but did not evaluate the outcomes as a composite) with ICP according to the week of disease onset(13).

In this study, CAPO was investigated according to the onset time of ICP, and, to our knowledge, it is the first studyof this nature in the literature. We consider this a strong aspect of our study. The limitations of the current study include its single-center and retrospective design and the limited number of patients in the EO-ICP group. Future multicenter and prospective studies that will include a large number of patients can elucidatethe detailed risk factors and outcomes of ICP according to the onset of the disease.

In conclusion, careful perinatal follow-up should be undertaken in patients with ICP due to the frequency of adverse perinatal outcomes. We consider that the high CAPO rates in the fetuses of patients with EO-ICP are due to the effect of high serum bile acid levels on the fetus for a longer time than in the LO-ICP group. Therefore, if ICP develops early, the patient should be informed in detail about possible complications and should be closely followed up.The differentiation of cases of EO-ICP and LO-ICP will serve as a guide for clinicians in predicting possible complications.

Conflict of interest statement
None

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Author contribution
ZA: methodology, data collection, writing, editing, AT: methodology, writing, editing, analysis, GI: technical assistance, data collection, correction, analysis, AP: technical assistance, data collection, correction, analysis, EGY: technical assistance, writing, editing, analysis, DS: methodology, design, correction, analysis

REFERENCES

1. Girling J, Knight CL, Chappell L. Intrahepatic cholestasis of pregnancy: Green-top Guideline No. 43 June 2022. Bjog. 2022;129(13):e95-e114.
2. Beuers U, Wolters F, Oude Elferink RPJ. Mechanisms of pruritus in cholestasis: understanding and treating the itch. Nat Rev Gastroenterol Hepatol. 2023;20(1):26-36.
3. Marathe JA, Lim WH, Metz MP, et al. A retrospective cohort review of intrahepatic cholestasis of pregnancy in a South Australian population. Eur J Obstet Gynecol Reprod Biol. 2017;218:33-8.
4. Gao XX, Ye MY, Liu Y, et al. Prevalence and risk factors of intrahepatic cholestasis of pregnancy in a Chinese population. Sci Rep. 2020;10(1):16307.
5. Wolf MF, Sgayer I, Yaron L, et al. Intrahepatic cholestasis of pregnancy - prevalence and ethnic distribution in northern Israel. Ginekol Pol. 2022.
6. Lee RH, Mara G, Metz TD, et al. Society for Maternal-Fetal Medicine Consult Series #53: Intrahepatic cholestasis of pregnancy: Replaces Consult #13, April 2011. Am J Obstet Gynecol. 2021;224(2):B2-b9.
7. Sahni A, Jogdand SD. Effects of Intrahepatic Cholestasis on the Foetus During Pregnancy. Cureus. 2022;14(10):e30657.
8. Majsterek M, Wierzchowska-Opoka M, Makosz I, et al. Bile Acids in Intrahepatic Cholestasis of Pregnancy. Diagnostics (Basel). 2022;12(11).
9. Xiao J, Li Z, Song Y, et al. Molecular Pathogenesis of Intrahepatic Cholestasis of Pregnancy. Can J Gastroenterol Hepatol. 2021;2021:6679322.
10. Herrera CA, Manuck TA, Stoddard GJ, et al. Perinatal outcomes associated with intrahepatic cholestasis of pregnancy(). J Matern Fetal Neonatal Med. 2018;31(14):1913-20.
11. Chen Y, Zhang H, Ning W, et al. The impact of intrahepatic cholestasis on pregnancy outcomes: a retrospective cohort study. BMC Gastroenterol. 2023;23(1):16.
12. Ovadia C, Seed PT, Sklavounos A, et al. Association of adverse perinatal outcomes of intrahepatic cholestasis of pregnancy with biochemical markers: results of aggregate and individual patient data meta-analyses. Lancet. 2019;393(10174):899-909.
13. Jin J, Pan SL, Huang LP, et al. Risk factors for adverse fetal outcomes among women with early- versus late-onset intrahepatic cholestasis of pregnancy. Int J Gynaecol Obstet. 2015;128(3):236-40.
14. Bicocca MJ, Sperling JD, Chauhan SP. Intrahepatic cholestasis of pregnancy: Review of six national and regional guidelines. Eur J Obstet Gynecol Reprod Biol. 2018;231:180-7.
15. Sarker M, Zamudio AR, DeBolt C, et al. Beyond stillbirth: association of intrahepatic cholestasis of pregnancy severity and adverse outcomes. Am J Obstet Gynecol. 2022;227(3):517.e1-.e7.
16. Chen J, Deng W, Wang J, et al. Primary bile acids as potential biomarkers for the clinical grading of intrahepatic cholestasis of pregnancy. Int J Gynaecol Obstet. 2013;122(1):5-8.
17. Brouwers L, Koster MP, Page-Christiaens GC, et al. Intrahepatic cholestasis of pregnancy: maternal and fetal outcomes associated with elevated bile acid levels. Am J Obstet Gynecol. 2015;212(1):100.e1-7.
18. Gallo DM, Romero R, Bosco M, et al. Meconium-stained amniotic fluid. Am J Obstet Gynecol. 2023;228(5s):S1158-s78.
19. Davis JD, Sanchez-Ramos L, McKinney JA, et al. Intrapartum amnioinfusion reduces meconium aspiration syndrome and improves neonatal outcomes in patients with meconium-stained fluid: a systematic review and meta-analysis. Am J Obstet Gynecol. 2023;228(5s):S1179-S91.e19.
20. Glantz A, Marschall HU, Mattsson LA. Intrahepatic cholestasis of pregnancy: Relationships between bile acid levels and fetal complication rates. Hepatology. 2004;40(2):467-74.
21. Çelik S, Çalışkan CS, Çelik H, et al. Predictors of adverse perinatal outcomes in intrahepatic cholestasis of pregnancy. Ginekol Pol. 2019;90(4):217-22.
22. Prediction and Prevention of Spontaneous Preterm Birth: ACOG Practice Bulletin, Number 234. Obstet Gynecol. 2021;138(2):e65-e90.
23. Wen SW, Smith G, Yang Q, et al. Epidemiology of preterm birth and neonatal outcome. Semin Fetal Neonatal Med. 2004;9(6):429-35.
24. Wikström Shemer E, Marschall HU, Ludvigsson JF, et al. Intrahepatic cholestasis of pregnancy and associated adverse pregnancy and fetal outcomes: a 12-year population-based cohort study. Bjog. 2013;120(6):717-23.
25. Chappell LC, Bell JL, Smith A, et al. Ursodeoxycholic acid versus placebo in women with intrahepatic cholestasis of pregnancy (PITCHES): a randomised controlled trial. Lancet. 2019;394(10201):849-60.
26. Marschall HU. Ursodeoxycholic acid for intrahepatic cholestasis in pregnancy. Lancet. 2019;394(10201):810-2.

27. Lee RH, Kwok KM, Ingles S, et al. Pregnancy outcomes during an era of aggressive management for intrahepatic cholestasis of pregnancy. Am J Perinatol. 2008;25(6):341-5.

28. Gardiner FW, McCuaig R, Arthur C, et al. The prevalence and pregnancy outcomes of intrahepatic cholestasis of pregnancy: A retrospective clinical audit review. Obstet Med. 2019;12(3):123-8.

29. ANUK AT, Özgür K. İntrahepatik gebelik kolestazı olan hastalarda safra asidi düzeyleri ile olumsuz gebelik sonuçları arasındaki ilişki: 120 vakanın retrospektif analizi. Jinekoloji-Obstetrik ve Neonatoloji Tıp Dergisi. 2022;19(1):1146-52.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Hysterectomy complications: five year long experience of a tertiary health center

Histerektomi komplikasyonları; üçüncü basamak sağlık merkezinin beş yıllık deneyimi

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ABSTRACT

Aim: This study aims to analyze the experience of a tertiary health center about the complications of hysterectomy within a period of five years.

Materials and Methods: This is a retrospective review of 1311 hysterectomies which were performed for both benign and malignant indications between 1 January 2017 and 1 January 2023.

Results: Complications occurred in 218 patients (16.6%) and the mortality rate was 0.5% (n=6). The rate of conversion into laparotomy was 2.8%. Bladder injury, colon injury, ileus and incisional hernia were significantly more frequent in women who underwent laparotomy (p=0.007, p=0.026, p=0.027 and p=0.010 respectively). Logistic regression analysis indicated hysterectomy technique as an independent prognostic factor for its complications (p=0.001). Ureter injury, bladder injury and colon injury were significantly less frequent in patients who had hysterectomy for gynecological malignancy (p=0.001, p=0.001 and p=0.015 respectively). Hospital stay was significantly longer in patients undergoing hysterectomy for laparotomy and gynecological malignancy (p=0.001 for both).

Conclusion: Minimally invasive techniques such as laparoscopy or vaginal approach should be attempted whenever it is possible and feasible. Performing hysterectomy for benign pathologies should not be considered as a distraction from meticulous work during the preoperative preparation and postoperative monitorization periods. Similar attention should be also paid to patients who have chronic diseases.

Keywords: Hysterectomy, laparoscopy, laparotomy, morbidity, mortality

ÖZ

Amaç: Üçüncü basamak sağlık merkezinin histerektomi komplikasyonları konusundaki beş yıllık deneyimini analiz etmeyi amaçlamaktadır.

Gereç ve Yöntemler: Bu yazı 1 Ocak 2017 ile 1 Ocak 2023 tarihleri arasında, hem malign hem de benign endikasyonlarla yapılan, 1311 histerektominin retrospektif incelemesidir.

Bulgular: Komplikasyonlar 218 hastada (%16,6) görüldü ve mortalite oranı %0,5 (n=6) idi. Laparotomiye dönüş oranı %2,8 idi. Laparotomi uygulanan kadınlarda mesane yaralanması, kolon yaralanması, ileus ve insizyonel herni anlamlı olarak daha sık görüldü (sırasıyla p=0,007, p=0,026, p=0,027 ve p=0,010). Lojistik regresyon analizi, histerektomi tekniğinin komplikasyonlar açısından bağımsız bir prognostik faktör olduğunu gösterdi (p=0.001). Jinekolojik malignite nedeniyle histerektomi yapılan hastalarda üreter yaralanması, mesane yaralanması ve kolon yaralanması anlamlı olarak daha az görüldü (sırasıyla p=0,001, p=0,001 ve p=0,015). Laparotomi ve jinekolojik malignite nedeniyle histerektomi yapılan hastaların hastanede kalış süresi daha uzundu (her ikisi için de p=0,001).

Sonuç: Mümkün ve uygulanabilir olduğunda laparoskopi veya vajinal yaklaşım gibi minimal invaziv teknikler denenmelidir. Benign patolojiler nedeniyle histerektomi yapılması, ameliyat öncesi hazırlık ve ameliyat sonrası takip dönemlerinde titiz çalışmaktan uzaklaşmak olarak düşünülmemelidir. Kronik hastalığı olan hastalara da aynı özen gösterilmelidir.

Anahtar Kelimeler: Histerektomi, laparoskopi, morbidite, mortalite

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INTRODUCTION

Hysterectomy refers to the surgical removal of the uterus and cervix (1). Since it is the most frequently performed operative procedure by gynecological surgeons, more than 600000 hysterectomies are conducted each year in the United States (2). The majority of hysterectomies are performed for benign indications (1, 3).

As a surgical procedure, hysterectomy has both benefits and risks which affect the hormonal balance and overall health (4). Accordingly, hysterectomy might lead to complications which differ with respect to the route and technique of surgery (5). The most commonly encountered complications of hysterectomy include hemorrhage, infections, venous thromboembolism, gastrointestinal injury, genitourinary damage, nerve injury, and vaginal cuff dehiscence (1, 2). Therefore, hysterectomy is recommended as the last choice of treatment for women in whom pharmacological agents and/or other interventions have failed (6).

Hysterectomy can be carried out by laparotomy, laparoscopy or by means of vaginal route (7). Despite the advance in surgical techniques, laparotomy remains the most commonly adopted route for hysterectomy. However, laparotomy is associated with significantly longer hospitalization, more severe postoperative pain, higher rate of infectious complications, and slower return to daily routine (8, 9). Vaginal route has been addressed as the most feasible approach for hysterectomy because it is the least invasive technique which leads to significantly faster recovery (8, 10). Laparoscopy requires minimal access and, thus, laparoscopic hysterectomy resembles vaginal hysterectomy in aspect of complications. On the other hand, laparoscopic hysterectomy is performed within a longer period of time and demands specialized instruments and training. Therefore, laparoscopy is more expensive than laparotomy and maintains the risks associated with abdominal incisions (11, 12).

The present study aims to analyze the experience of a tertiary health center about the complications of hysterectomy within a period of five years.

MATERIALS AND METHODS

The present study is approved by ethical committee of Afyonkarahisar Health Sciences University Hospital where it was undertaken (10.10.2023-2023/432). Written informed consent was obtained from each participant. This study was conducted in accordance with the principles revealed by the Declaration of Helsinki.

This is a retrospective review of 1311 hysterectomies which were performed for both benign and malignant indications at the study center between 1 January 2017 and 1 January 2023. Data related with hysterectomy time, hysterectomy route, hysterectomy indication and adnexal surgery were acquired form medical records.

According to 9th revision of International Classification of Diseases-Clinical Modification (ICD-9-CM), hysterectomy techniques were classified as laparoscopy, laparotomy, and vaginal route. Laparoscopy assisted vaginal hysterectomy was identified as laparoscopic hysterectomy whereas postpartum hysterectomy was designated as laparotomic hysterectomy.

Primary outcomes were the occurrence of complications, need for conversion to laparotomy, and length of hospitalization. The Clavien–Dindo classification was adopted to categorize the complications of hysterectomy. This system defines a complication as any deviation from the optimal progression which is not related to surgery, and which cannot be regarded as an obstacle for the success of the operation. The grades in Clavien–Dindo classification are based on the degree of severity and the need for treatment (13).

Grade I describes any deviation from the normal postoperative course which does not require any pharmacological treatment, radiological imaging, endoscopy and/or surgery. Grade I complications involves the use of drugs as antiemetics, antipyretics, analgesics, diuretics, and electrolytes as well as physiotherapy. Grade II complications need pharmacological agents other than those allowed for grade I complications. These pharmacological agents include blood transfusions and total parenteral nutrition.

Grade III complications are those which should be treated by surgical, endoscopic, or radiological intervention. Grade IV complications are life-threatening problems which should be managed at an intensive care unit and Grade V refers to mortality (13).

A chronic disease is a health condition which persists, appears with time, or has long-lasting effects. Chronic diseases included this study consist of hypertensive disorders (n=94), diabetes mellitus (n=81), functional gastrointestinal disorders (n=63), arthritis (n=59), asthma (n=72), chronic obstructive pulmonary disease (n=63), autoimmune diseases (n=55), genetic disorders (n=64) and viral diseases such as hepatitis B and C (n=71).

Collected data were analyzed by Statistical Package for Social Sciences version 22.0 (SPSS, SPSS IBM., Armonk, NY, USA). Continuous data were expressed as mean ± standard deviation whereas categorical data were denoted as numbers and percentages. Student t test, one way analysis of variance, chi square test and Kruskal-Wallis test were used for the comparisons. Logistic regression analysis was done to specify the prognostic factors for the occurrence of hysterectomy

complications. Two-tailed p values <0.05 were accepted as statistically significant.

RESULTS

Complications occurred in 218 patients (16.6%) and the mortality rate was 0.5% (n=6).

Table 1 shows complications in aspect of hysterectomy technique. Bladder injury, colon injury, ileus and incisional hernia were significantly more frequent in women who underwent laparotomy (p=0.007, p=0.026, p=0.027 and p=0.010 respectively). Dysrhythmia, massive bleeding, intraabdominal abscess, and cuff prolapse were significantly more common in patients who had vaginal hysterectomy (p=0.016, p=0.007, p=0.002 and p=0.005 respectively). Wound infection and the need for transfusion were also significantly more common in the laparotomy group (p=0.001 for both). Hospital stay was significantly longer in patients undergoing laparotomic hysterectomy (p=0.001).

Laparoscopy was converted into laparotomy in 18 patients and the rate of conversion to laparotomy was 2.8%. Twenty-three patients in the laparotomy group had postpartum hysterectomy and vaginal hysterectomy was laparoscopy assisted in 10 patients (Table 2).

Table 3 summarizes complications with respect to malignancy. Ureter injury, bladder injury and colon injury were significantly less frequent in patients who had hysterectomy for gynecological malignancy (p=0.001, p=0.001 and p=0.015 respectively). Vocal cord palsy, incisional hernia and neurological injury were significantly less common in patients who underwent hysterectomy

Table 1. Hysterectomy complications by technique

	Total (n=1311)	Laparoscopy (n=625)	Laparotomy (n=571)	Vaginal (n=133)	p
Grade I					
Hypertension	19 (1.4%)	6 (1.0%)	12 (2.1%)	1 (0.9%)	0.221
Dysrhythmia	16 (1.2%)	3 (0.5%)	9 (1.6%)	4 (3.5%)	0.016*
Delirium	8 (0.6%)	3 (0.5%)	5 (0.9%)	0 (0.0%)	0.462
Vocal cord palsy	3 (0.2%)	1 (0.2%)	2 (0.4%)	0 (0.0%)	0.683
Neurological injury	10 (0.8%)	6 (1.0%)	3 (0.5%)	1 (0.9%)	0.683
Wound infection	29 (2.2%)	2 (0.3%)	25 (4.4%)	2 (1.7%)	0.001*
Grade II					
Ileus	11 (0.8%)	1 (0.2%)	9 (1.6%)	1 (0.9%)	0.027*
Massive bleeding	19 (1.4%)	4 (0.6%)	10 (1.8%)	5 (4.3%)	0.007*
Need for transfusion	317 (24.2%)	112 (17.9%)	175 (30.6%)	22 (19.1%)	0.001*
Venous thromboembolism	4 (0.3%)	1 (0.2%)	3 (0.5%)	0 (0.0%)	0.428
Thrombophlebitis	1 (0.1%)	1 (0.2%)	0 (0.0%)	0 (0.0%)	0.577
Cuff cellulitis	2 (0.2%)	1 (0.25)	1 (0.2%)	0 (0.0%)	0.906
Grade III					
Ureter injury	11 (0.8%)	4 (0.6%)	6 (1.1%)	1 (0.9%)	0.738
Bladder injury	40 (3.1%)	12 (1.9%)	27 (4.7%)	1 (0.9%)	0.007*
Colon injury	14 (1.1%)	3 (0.5%)	11 (1.9%)	0 (0.0%)	0.026*
Vesicovaginal fistula	5 (0.4%)	3 (0.5%)	2 (0.4%)	0 (0.0%)	0.735
Rectovaginal fistula	1 (0.1%)	1 (0.2%)	0 (0.0%)	0 (0.0%)	0.577
Incisional hernia	23 (1.8%)	6 (1.0%)	17 (3.0%)	0 (0.0%)	0.010*
Intestinal eventration	1 (0.1%)	0 (0.0%)	1 (0.2%)	0 (0.0%)	0.523
Port site metastasis	1 (0.1%)	1 (0.2%)	0 (0.0%)	0 (0.0%)	0.577
Ovary torsion	1 (0.1%)	1 (0.2%)	0 (0.0%)	0 (0.0%)	0.577
Intraabdominal abscess	6 (0.5%)	2 (0.3%)	1 (0.2%)	3 (2.6%)	0.002*
Cuff prolapse	1 (0.1%)	0 (0.0%)	1 (0.2%)	0 (0.0%)	0.005*
Cuff dehiscence	1 (0.1%)	1 (0.2%)	0 (0.0%)	1 (0.9%)	0.093
Grade IV					
Atelectasis	6 (0.5%)	2 (0.3%)	4 (0.7%)	0 (0.0%)	0.466
Pleural effusion	2 (0.2%)	0 (0.0%)	2 (0.4%)	0 (0.0%)	0.273
Trachea rupture	2 (0.2%)	2 (0.3%)	0 (0.0%)	0 (0.0%)	0.333
Diabetic ketoacidosis	2 (0.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.273
Grade V					
Mortality	6 (0.5%)	1 (0.2%)	5 (0.9%)	0 (0.0%)	0.140
Hospital stay (days)	3.37+2.7	2.79+0.05	4.05±0.71	3.09±1.23	0.001*

*p<0.05 was accepted as statistically significant.

Table 2. Hysterectomy complications by alternative techniques

	Laparoscopy to laparotomy (n=18)	Postpartum hysterectomy (n=23)	Laparoscopy assisted vaginal hysterectomy (n=10)
Atelectasis	1 (5.6%)	1 (4.3%)	0 (0.0%)
Ureter injury	0 (0.0%)	2 (8.7%)	0 (0.0%)
Bladder injury	3 (16.7%)	3 (13.0%)	0 (0.0%)
Intestinal evisceration	1 (5.6%)	0 (0.0%)	0 (0.0%)
Massive bleeding	3 (16.7%)	0 (0.0%)	0 (0.0%)
Ileus	1 (5.6%)	2 (8.7%)	0 (0.0%)
Hypertension	1 (5.6%)	1 (4.3%)	1 (10.0%)
Dysrhythmia	1 (5.6%)	0 (0.0%)	0 (0.0%)
Delirium	0 (0.0%)	1 (4.3%)	0 (0.0%9
Wound infection	0 (0.0%)	0 (0.0%)	1 (10.0%)
Mortality	0 (0.0%)	1 (4.3%9	0 (0.0%)

Table 3. Hysterectomy complications by malignancy

	Total (n=1311)	No malignancy (n=369)	Malignancy (n=942)	p
Grade I				
Hypertension	19 (1.4%)	12 (3.3%)	7 (0.7%)	0.001*
Dysrhythmia	16 (1.2%)	8 (2.2%)	8 (0.8%)	0.050
Delirium	8 (0.6%)	5 (1.4%)	3 (0.3%)	0.030*
Vocal cord palsy	3 (0.2%)	3 (0.8%)	0 (0.0%)	0.006*
Neurological injury	10 (0.8%)	9 (2.4%)	1 (0.1%)	0.001*
Wound infection	29 (2.2%)	24 (6.5%)	5 (0.5%)	0.001*
Grade II				
Ileus	11 (0.8%)	7 (1.9%)	4 (0.4%)	0.009*
Massive bleeding	19 (1.4%)	16 (4.3%)	3 (0.3%)	0.001*
Need for transfusion	317 (24.2%)	221 (59.9%)	96 (10.2%)	0.001*
Venous thromboembolism	4 (0.3%)	2 (0.5%)	2 (0.2%)	0.330
Thrombophlebitis	1 (0.1%)	1 (0.3%)	0 (0.0%)	0.110
Cuff cellulitis	2 (0.2%)	2 (0.5%)	0 (0.0%)	0.024*
Grade III				
Ureter injury	11 (0.8%)	8 (2.2%)	3 (0.3%)	0.001*
Bladder injury	40 (3.1%)	30 (8.1%)	10 (1.1%)	0.001*
Colon injury	14 (1.1%)	8 (2.2%)	6 (0.6%)	0.015*
Vesicovaginal fistula	5 (0.4%)	3 (0.8%)	2 (0.2%)	0.113
Rectovaginal fistula	1 (0.1%)	1 (0.3%)	0 (0.0%)	0.110
Incisional hernia	23 (1.8%)	15 (4.1%)	8 (0.8%)	0.001*
Intestinal eventration	1 (0.1%)	0 (0.0%)	1 (0.1%)	0.531
Port site metastasis	1 (0.1%)	0 (0.0%)	1 (0.1%)	0.531
Ovary torsion	1 (0.1%)	1 (0.3%)	0 (0.0%)	0.110
Intraabdominal abscess	6 (0.5%)	4 (1.1%)	2 (0.2%)	0.035*
Cuff prolapse	1 (0.1%)	1 (0.3%)	0 (0.0%)	0.110
Cuff dehiscence	1 (0.1%)	1 (0.3%)	0 (0.0%)	0.110
Grade IV				
Atelectasis	6 (0.5%)	2 (0.5%)	3 (0.3%)	0.555
Pleural effusion	2 (0.2%)	0 (0.0%)	2 (0.2%)	0.376
Trachea rupture	2 (0.2%)	0 (0.0%)	2 (0.2%)	0.376
Diabetic ketoacidosis	2 (0.2%)	0 (0.0%)	2 (0.2%)	0.376
Grade V				
Mortality	6 (0.5%)	2 (0.5%)	4 (0.4%)	0.777
Hospital stay (days)	3.37+2.7	3.10±1.94	3.76±1.60	0.001*

*p<0.05 was accepted as statistically significant.

Table 4. Hysterectomy complications by chronic disease

	Total (n=1311)	No chronic disease (n=689)	Chronic disease (n=622)	p
Grade I				
Hypertension	19 (1.4%)	8 (1.2%)	11 (1.8%)	0.358
Dysrhythmia	16 (1.2%)	6 (0.9%)	10 (1.6%)	0.225
Delirium	8 (0.6%)	1 (0.1%)	7 (1.1%)	0.023*
Vocal cord palsy	3 (0.2%)	3 (0.4%)	0 (0.0%)	0.099
Neurological injury	10 (0.8%)	4 (0.6%)	6 (1.0%)	0.425
Wound infection	29 (2.2%)	14 (2.0%)	15 (2.4%)	0.641
Grade II				
Ileus	11 (0.8%)	7 (1.0%)	4 (0.6%)	0.460
Massive bleeding	19 (1.4%)	12 (1.7%)	7 (1.1%)	0.351
Need for transfusion	317 (24.2%)	174 (25.3%)	143 (23.0%)	0.339
Venous thromboembolism	4 (0.3%)	1 (0.1%)	3 (0.5%)	0.269
Thrombophlebitis	1 (0.1%)	1 (0.1%)	0 (0.0%)	0.342
Cuff cellulitis	2 (0.2%)	1 (0.1%)	1 (0.2%)	0.942
Grade III				
Ureter injury	11 (0.8%)	8 (1.2%)	3 (0.5%)	0.178
Bladder injury	40 (3.1%)	27 (3.9%)	13 (2.1%)	0.055
Colon injury	14 (1.1%)	11 (1.6%)	3 (0.5%)	0.050
Vesicovaginal fistula	5 (0.4%)	1 (0.1%)	4 (0.6%)	0.144
Rectovaginal fistula	1 (0.1%)	0 (0.0%)	1 (0.2%)	0.292
Incisional hernia	23 (1.8%)	12 (1.7%)	11 (1.8%)	0.971
Intestinal evisceration	1 (0.1%)	0 (0.0%)	1 (0.2%)	0.292
Port site metastasis	1 (0.1%)	0 (0.0%)	1 (0.2%)	0.292
Ovary torsion	1 (0.1%)	1 (0.1%)	0 (0.0%)	0.342
Neurological injury	10 (0.8%)	4 (0.6%)	6 (1.0%)	0.425
Intraabdominal abscess	6 (0.5%)	2 (0.3%)	4 (0.6%)	0.345
Cuff prolapse	1 (0.1%)	1 (0.1%)	0 (0.0%)	0.342
Cuff dehiscence	1 (0.1%)	1 (0.1%)	0 (0.0%)	0.342
Grade IV				
Atelectasis	6 (0.5%)	4 (0.6%)	2 (0.3%)	0.488
Pleural effusion	2 (0.2%)	0 (0.0%)	2 (0.3%)	0.136
Trachea rupture	2 (0.2%)	1 (0.1%)	1 (0.2%)	0.942
Diabetic ketoacidosis	2 (0.2%)	0 (0.0%)	2 (0.3%)	0.136
Grade V				
Mortality	6 (0.5%)	1 (0.1%)	5 (0.8%)	0.078
Hospital stay (days)	3.37+2.7	3.14±1.70	3.63±1.47	0.001*

*p<0.05 was accepted as statistically significant.

Table 5. Logistic regression analysis for hysterectomy complications

	Odd ratio (95% Confidence interval)	p
Technique	0.262 (0.068-0.475)	0.001*
Malignancy	0.171 (0.163-0.182)	0.263
Chronic disease	0.138 (0.119-0.156)	0.444

*p<0.05 was accepted as statistically significant

for malignant pathologies (p=0.006, p=0.001 and p=0.001 respectively). Massive bleeding and need for transfusion were also significantly less frequent in patients who were hysterectomized for gynecological malignancy (p=0.001 for both). Ileus, hypertension, and delirium were significantly less common in patients who had hysterectomy for malignant conditions (p=0.009, p=0.001 and p=0.030 respectively). Wound infection, intraabdominal abscess and cuff cellulitis were significantly less frequent in patients who underwent hysterectomy for malignant pathologies (p=0.001, p=0.035 and p=0.024 respectively). Hospital stay was significantly longer in patients undergoing hysterectomy for gynecological malignancy (p=0.001). Thirteen patients with gynecological malignancy (1.4) had a IV/V complication based on Clavien-Dindo classification.

Table 4 indicates that delirium was significantly more frequent and hospital stay was significantly longer in hysterectomized patients with chronic disease (p=0.023 and p=0.001 respectively). Logistic

regression analysis indicated hysterectomy technique as an independent prognostic factor for its complications (p=0.001).

DISCUSSION

Hysterectomy has been described as the ultimate treatment for uterine pathologies. Accordingly, leiomyomas, abnormal bleeding and gynecological tumors have been enlisted as the main indications for hysterectomy (14). Since hysterectomy is the most commonly performed gynecological surgery, it would be prudent to expect that this operation would be associated with complications (1, 2). Therefore, this study has been designed to analyze the five-year long experience of a tertiary health center about the complications of hysterectomy.

The decision for the route of hysterectomy should be made according to the indication, surgeon's experience, and existence of any concurrent pathology and/or chronic disease. It has

been recommended that less invasive techniques should be used for hysterectomy and, thus,

laparoscopy should be preferred in case vaginal hysterectomy cannot be performed (6, 7).

Laparoscopy provides certain advantages over laparotomy, and technological improvements have allowed the implementation of laparoscopic techniques in gynecological surgery. The advantages of laparoscopy include less postoperative pain, shorter hospital stays, and less blood loss (15-17). Two meta-analyses have verified that postoperative pain and blood loss were significantly lower in patients who undergo laparoscopic hysterectomy than those who undergo hysterectomy by laparotomy. The length of hospitalization and recovery were also found to be significantly shorter in patients who have laparoscopy than patients who have laparotomy. On the contrary, the risk of urinary tract injury was significantly higher in patients undergoing laparoscopic hysterectomy (7, 18).

In this study, bladder injury, colon injury, ileus, wound infection, and need for transfusion were significantly more frequent in women who underwent hysterectomy by laparotomy. Moreover, hospital stay was significantly longer in patients undergoing laparotomy. These findings comply with literature. Yet, in this study, the rate of bladder injury was significantly lower in women undergoing laparoscopic hysterectomy. This significantly lower rate of bladder injury might be due to the selection criteria for patients. That is, the patients who had previous abdominal and/or pelvic surgery might have been recruited for laparotomy. A body of evidence for this hypothesis is the increase in the risk of hysterectomy related complications for the patients who have delivered by cesarean section previously (15-17). Another underlying factor might be the conductance of laparoscopic hysterectomy by experienced surgeons. A retrospective review has concluded that laparoscopy is not associated with anatomical complications for experienced surgeons. Thus, supporting the surgeons until the completion of learning curve for laparoscopy might decrease the complication rates (19).

Laparoscopy can be switched to laparotomy in up to 19% hysterectomies (20). A Turkish study reported the rate of conversion to laparotomy as 7% (21). The lower conversion rate of 7% in this study might be attributed to the experience of surgeons about laparoscopy.

The RISC-Gyn trial has been held to determine the role of predictive markers for severe postoperative complications in women undergoing surgery for gynecological malignancies. This trial revealed that 17.7% of the gynecological oncology patients (n=226) experienced a grade ≥IIIb complication according to Clavien-Dindo system and the mortality rate was 3.8% (22). A retrospective analysis of Dutch Gynecological Oncology Audit detected Clavien grade ≥IIIb complications in 10.3% of 1027 patients who had primary debulking and 9% of 1355 patients who underwent interval debulking for ovarian cancer (23). In contrast, an examination of 6551 patients with gynecological malignancy indicated Clavien grade IV/V complications in 2.9% of the patients. Additionally, this examination also addressed non-laparoscopic approach as a risk factor for severe postoperative complications (24).

As for the present study, only 1.4% of the patients who were hysterectomized for gynecological tumors had Clavien grade IV/V complication and mortality rate corresponded to 0.4%. The significantly lower rate of severe morbidity and mortality in this study might be the result of carefully handled preoperative preparation and postoperative monitorization processes for the patients with gynecological malignancy. Such discrepancy might also be attributed to the relatively lower number of the patients with early-stage malignancy. Therefore, the lack of data related with the severity of gynecological tumors might be regarded as a power-limiting factor for this study.

An interesting finding of this study is that patients with chronic disease experience delirium significantly more frequent after hysterectomy. Delirium has been identified as the acute depression in cognitive and behavioral potential of the hospitalized individuals (25). This depression especially emerges as a significant problem for patients who have had surgery (25, 26). A population-based study has determined the Odds ratio for delirium as 5.99 in women

undergoing hysterectomy due to gynecological malignancy. The same study also highlighted higher comorbidity index as a risk factor for postoperative delirium (27). It has been well established that delirium further increases morbidity and prolongs hospitalization (26, 28). This might be the reason for the significantly longer hospital stay of the hysterectomized patients with chronic disease in this study.

CONCLUSION

Minimally invasive techniques such as laparoscopy or vaginal approach should be attempted whenever it is possible and feasible. The results of the present study also suggest that performing hysterectomy for benign pathologies should not be considered as a distraction from meticulous work during the preoperative preparation and postoperative monitorization periods. Similar attention should be also paid to patients who have been already diagnosed with chronic diseases as these patients are prone to cognitive impairment and prolongation in hospital stay. However, these conclusions should be interpreted cautiously as their power is limited by the retrospective design, relatively small and heterogenous cohort of the present study. The lack of data with age, body mass index, obstetric history, and previous surgeries might also be specified as power-limiting factors.

Further research has been warranted to identify the complications associated with hysterectomy in various patient populations.

Author Contributions

R Dur: Protocol/project development, Manuscript writing; Sİ Paltacı: Data collection or management, Acquisition; S Garibova: Data collection or management; F Çelik: Manuscript editing; MK Pektaş: Protocol/project development, analysis, Manuscript writing and editing

Conflict of Interest

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REFERENCES

1. Ramdhan RC, Loukas M, Tubbs RS. Anatomical complications of hysterectomy: A review. Clin Anat 2017; 30(7): 946-52.
2. Clarke-Pearson DL, Geller EJ. Complications of hysterectomy. Obstet Gynecol 2013; 121(3): 654-73.
3. Stang A, Merrill RM, Kuss O. Prevalence-corrected hysterectomy rates by age and indication in Germany 2005-2006. Arch Gynecol Obstet 2012; 286(5): 1193-200.
4. Madueke-Laveaux OS, Elsharoud A, Al-Hendy A. What We Know about the Long-Term Risks of Hysterectomy for Benign Indication-A Systematic Review. J Clin Med 2021; 10(22): 5335.
5. Danilyants N, MacKoul P, Baxi R, van der Does LQ, Haworth LR. Value-based assessment of hysterectomy approaches. J Obstet Gynaecol Res 2019; 45(2): 389-98.
6. Lefebvre G, Allaire C, Jeffrey J, Vilos G. No. 109-Hysterectomy. J Obstet Gynaecol Can 2018; 40(7): e567-e579.
7. Pickett CM, Seeratan DD, Mol BWJ, Nieboer TE, Johnson N, Bonestroo T, Aarts JW. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane Database Syst Rev 2023; 8(8): CD003677.
8. Barker MA. Current Issues with Hysterectomy. Obstet Gynecol Clin North Am. 2016 Sep;43(3):591-601.
9. Chevrot A, Margueritte F, Fritel X, Serfaty A, Huchon C, Fauconnier A. Hystérectomie : évolution des pratiques entre 2009 et 2019 en France [Hysterectomy: Practices evolution between 2009 and 2019 in France]. Gynecol Obstet Fertil Senol 2021; 49(11): 816-22.
10. Geller EJ. Vaginal hysterectomy: the original minimally invasive surgery. Minerva Ginecol 2014; 66(1): 23-33.
11. Sandberg EM, Twijnstra ARH, Driessen SRC, Jansen FW. Total Laparoscopic Hysterectomy Versus Vaginal Hysterectomy: A Systematic Review and Meta-Analysis. J Minim Invasive Gynecol 2017; 24(2): 206-217.e22.
12. Lee SH, Oh SR, Cho YJ, Han M, Park JW, Kim SJ, Yun JH, Choe SY, Choi JS, Bae JW. Comparison of vaginal hysterectomy and laparoscopic hysterectomy: a systematic review and meta-analysis. BMC Womens Health 2019; 19(1): 83.
13. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Ann Surg 2004; 240(2): 205-13.
14. Solnik MJ, Munro MG. Indications and alternatives to hysterectomy. Clin Obstet Gynecol 2014; 57(1): 14-42.
15. Driessen SR, Baden NL, van Zwet EW, Twijnstra AR, Jansen FW. Trends in the implementation of advanced minimally invasive gynecologic surgical procedures in the Netherlands. J Minim Invasive Gynecol 2015; 22(4): 642-7.
16. Schollmeyer T, Elessawy M, Chastamouratidhs B, Alkatout I, Meinhold-Heerlein I, Mettler L, Jonat W, Weigel MT. Hysterectomy trends over a 9-year period in an endoscopic teaching center. Int J Gynaecol Obstet 2014; 126(1): 45-9.
17. Lee J, Jennings K, Borahay MA, Rodriguez AM, Kilic GS, Snyder RR, Patel PR. Trends in the national distribution of laparoscopic hysterectomies from 2003 to 2010. J Minim Invasive Gynecol 2014; 21(4): 656-61.
18. Aarts JW, Nieboer TE, Johnson N, Tavender E, Garry R, Mol BW, Kluivers KB. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane Database Syst Rev 2015 Aug 12; 2015(8): CD003677.
19. Naveiro-Fuentes M, Rodríguez-Oliver A, Fernández-Parra J, González-Paredes A, Aguilar-Romero T, Mozas-Moreno J. Effect of surgeon's experience on complications from laparoscopic hysterectomy. J Gynecol Obstet Hum Reprod 2018; 47(2): 63-7.
20. Twijnstra AR, Blikkendaal MD, van Zwet EW, Jansen FW. Clinical relevance of conversion rate and its evaluation in laparoscopic hysterectomy. J Minim Invasive Gynecol 2013; 20(1): 64-72.
21. Mat E, Yildiz P, Yilmaz TG, Ozer EB, Basol G, Kurt D, Gundogdu EC. Total Laparoscopic Hysterectomy Experience: Retrospective Results of a Tertiary Center. South Clin Ist Euras 2021; 32(3): 311-5.
22. Inci MG, Richter R, Woopen H, Rasch J, Heise K, Anders L, Mueller K, Nasser S, Siepmann T, Sehouli J. Role of predictive markers for severe postoperative complications in gynecological cancer surgery: a prospective study (RISC-Gyn Trial). Int J Gynecol Cancer 2020; 30(12): 1975-82.
23. Baldewpersad Tewarie NMS, van Driel WJ, van Ham M, Wouters MW, Kruitwagen R; participants of the Dutch Gynecological Oncology Collaborator Group. Postoperative outcomes of primary and interval cytoreductive surgery for advanced ovarian cancer registered in the Dutch Gynecological Oncology Audit (DGOA). Gynecol Oncol 2021; 162(2): 331-8.
24. Uppal S, Igwe E, Rice LW, Spencer RJ, Rose SL. Frailty index predicts severe complications in gynecologic oncology patients. Gynecol Oncol 2015; 137(1): 98-101.

25. Mattison MLP. Delirium. Ann Intern Med 2020; 173(7): ITC49-ITC64.

26. Xiao MZ, Liu CX, Zhou LG, Yang Y, Wang Y. Postoperative delirium, neuroinflammation, and influencing factors of postoperative delirium: A review. Medicine (Baltimore) 2023; 102(8): e32991.

27. Bandini M, Marchioni M, Preisser F, Nazzani S, Tian Z, Graefen M, Montorsi F, Saad F, Shariat SF, Schips L, Briganti A, Karakiewicz PI. Comprehensive analysis of in-hospital delirium after major surgical oncology procedures: A population-based study. Can Urol Assoc J 2020; 14(3): E84-E93.

28. Raats JW, van Eijsden WA, Crolla RM, Steyerberg EW, van der Laan L. Risk Factors and Outcomes for Postoperative Delirium after Major Surgery in Elderly Patients. PLoS One 2015; 10(8): e0136071.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Perinatal outcomes of 14 HIV-positive pregnant women followed up in a tertiary center in Turkey

Türkiye'de üçüncü basamak bir merkezde takip edilen 14 HIV pozitif gebe kadının perinatal sonuçları

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ABSTRACT

Aim: To evaluate theperinatal outcomes of 14 HIV (humanimmunodeficiency virus) positive pregnant women followed up in a tertiary center.

Materials and Methods: This is a retrospective cohort study conducted in Ankara Bilkent City Hospital perinatology clinic. All pregnant women who were followed up with a diagnosis of HIV positive between 2020 and 2023 were included in the study. Demographic characteristics of pregnant women, time of diagnosis, antiretroviral treatment received in the prenatal and intrapartum period, antiretroviral treatment received by infants and duration, and vertical transmission rate were evaluated.

Results: A total of 14 HIV-positive pregnant women were included in the study. Two cases (14.28%) were in the first trimester, one case (7.14%) was in the second trimester, 10 cases (71.42%) were in the third trimester, and one case (7.14%) was in the 10th postpartum day at first admission to hospital. Nine (64.3%) of the patients had regular hospital follow-ups with regular tests and treatment. While 5 (35.7%) did not attend regular follow-ups and did not receive regular treatment. The mean CD4+ count was 611±243 cell/mm^3 and the CD8+ count was 852±366 cell/mm^3. The mean CD4/CD8 ratio was 0.94±0.74. The maternal HIV plasma RNA copy numberwas not checked in one patient, the result was negative in 5 patients and was positive in the remaining 8 patients. The median HIV RNA was 471 (range 0-106559) copy/mL. Since the infants were born at different times, they were divided into 2 groups: 0-18 months and 18-40 months. All babies were regularly followed up by a pediatrician and an infectious disease specialist. All infants were given standard treatment with lamivudine/zidovudine and raltegravir. IV positivity was not detected in any of the babies in the controls performed after 18 months.

Conclusion: In conclusion, maternal HIV infection is associated with favorable outcomes if managed appropriately by a multidisciplinary team.

Keywords: HIV, humanimmunodeficiency virus, perinatal outcome, vertical transmission

ÖZ

Amaç: Üçüncü basamak bir merkezde takip edilen 14 HIV (insan immün yetmezlik virüsü) pozitif gebe kadının perinatal sonuçlarını değerlendirmek.

Gereç ve Yöntemler:: Bu, Ankara Bilkent Şehir Hastanesi perinatoloji kliniğinde yürütülen retrospektif bir kohort çalışması olupçalışmaya 2020-2023 yılları arasında HIV pozitif tanısıyla takip edilen tüm gebeler dahil edildi. Çalışmaya 2020-2023 yılları arasında HIV pozitif tanısıyla takip edilen tüm gebeler dahil edildi. Gebelerin demografik özellikleri, tanı zamanı, prenatal ve intrapartum dönemde aldıkları antiretroviral tedavi, bebeklere aldıkları antiretroviral tedavi ve süreleri, vertikal bulaşma oranları değerlendirildi.

Bulgular: Çalışmaya toplam 14 HIV pozitif gebe dahil edildi. Olguların 2'si (%14,28) birinci trimesterde, bir olgu (%7,14) ikinci trimesterde, 10 olgu (%71,42) üçüncü trimesterde ve bir olgu (%7,14) postpartum 10. günde idi. Hastalardan dokuzunun (%64,3) düzenli hastane takipleri ve düzenli tetkik ve tedavileri vardı. 5'i (%35,7) düzenli kontrollere gelmemiş ve düzenli tedavi görmemişti. Ortalama CD4+ sayısı 611±243 hücre/mm^3, CD8+ sayısı ise 852±366 hücre/mm^3 idi. Ortalama CD4/CD8 oranı 0,94±0,74 idi. Bir hastada annenin HIV plazma RNA kopya numarasına bakılmadı, 5 hastada sonuç negatif, 8 hastada ise pozitif çıktı. Medyan HIV RNA'sı 471 (aralık 0-106559) kopya/mL idi. Bebekler farklı zamanlarda doğdukları için 0-18 ay ve 18-40 ay olmak üzere 2 gruba ayrıldılar. Bebeklerin tamamı çocuk doktoru ve enfeksiyon hastalıkları uzmanı tarafından düzenli olarak takip edildi. Tüm bebeklere lamivudin/zidovudin ve raltegravir ile standart tedavi verildi. 18 ay sonra yapılan kontrollerde bebeklerin hiçbirinde HIV pozitifliğine rastlanmadı.

Sonuç: Sonuç olarak, annede HIV enfeksiyonu multidisipliner bir ekip tarafından uygun şekilde yönetildiğinde olumlu sonuçlarla ilişkili olduğu gözlenmiştir.

Anahtar Kelimeler: HIV, insan immün yetmezlik virüsü, perinatal sonuçlar, vertikal bulaşma

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INTRODUCTION

HIV is an RNA virus that could cause Acquired immunodeficiency syndrome (AIDS) in humans and is an important cause of mortality in some parts of the world in the last decades. The prevalence of HIV infection is 0,7 percent worldwide, but incidence varies and increasing in some countries (1).

The majority of adults who are infected with HIV are at reproductive ages and that makes this topic an important issue in the pregnant population. The pregnant population is special because of the changed immunity in that period, the role of perinatal transmission, and unique treatment regimens in pregnancy.

Perinatal HIV transmission can occur in utero, intrapartum, or during breastfeeding. In utero transmission accounts for 5%-10% of all perinatal transmissions (2). In utero transmission occurs by tranplacental or by ascending infection through the vagina. The main route of perinatal HIV transmission is intrapartum(3). Intrapartum transmission occurs through contact of infant mucous membranes with maternal blood or infected cervicovaginal secretions. There is increasing evidence in studies that maternal-fetal microtransfusions, which develop after disruption of the placental barrier, which can be seen from the early weeks of pregnancy, are frequent and recurrent conditions in pregnancy (4). The probability of HIV infection in breastfeeding women not receiving HAART (highly active antiretroviral therapy) is between 10-15% (5). With the use of retroviral drugs, the risk of transmission has decreased to 2%. Amniocentesis, chorionic villus sampling, use of vacuum or forceps, and use of fetal scalp electrodes in pregnant women not taking retroviral drugs are associated with an increased risk of perinatal transmission.

Maternal HIVRNA load is very important in maternal transmission, especially for values below 100 copies, the risk of transmission is low (6).

The management of HIV-positive pregnant women has improved in the last 3 decades with advances in drug development and prevention of vertical transmission. With the administration of antiretroviral drugs in developed societies such as the United States and Europe, mother-to-child transmission has fallen to its lowest level in history (7). The goal of using antiretroviral therapy (ART) during pregnancy is to reduce vertical transmission and treat maternal HIV disease (8). All HIV-positive pregnant women, regardless of CD4 cell count or plasma HIV viral load, should receive ART therapy to treat maternal infection and to prevent mother-to-child transmission. Antiretroviral therapy during the three phases (antepartum, intrapartum, and postpartum) is superior to intrapartum therapy alone and combination therapy is more effective than a single-drug regimen in reducing HIV transmission (9, 10). ART should be started before pregnancy or in the first trimester to prevent vertical transmission(11). Some mothers may want to postpone ART until after the first trimester is completed due to concerns about teratogenic effects, but delaying treatment, especially after the 28th week, leads to increased vertical transmission (12).

Treatment of infants should begin immediately after birth, ideally between 6 and 12 hours. The treatment regimen should be decided based on the treatment the mother received before birth, maternal viral load, and the baby's nutrition.

In our study, we aimed to evaluate the perinatal outcomes of HIV-positive Turkish pregnant women and HIV-positive immigrants who may have difficulty in reaching health institutions and treatment, to determine the current situation and to contribute to developing methods that will try to minimize vertical transmission by making projections for the future.

MATERIALS AND METHODS

This retrospective cohort study was conducted on all HIV consecutive cases who were followed up and delivered in the perinatology clinic of Ankara Bilkent City Hospital between January 2020 and December 2023. The study protocol was approved by the ethics committee with the reference number E2-23-5901 and all participants gave written consent.

Maternal age, gravida, parity, gestational age at first admission to hospital, duration of HIV positivity, antiretroviral treatment use, treatment regimen, treatment compliance, and continuity, smoking or drug use, complete blood count, renal function tests, liver function tests: presence and type of hepatitis, latent tuberculosis, history of amniocentesis or CVS, HIV RNA viral load, CD4 countduring pregnancy, OGTT result, HIV genotype resistance studies (If RNA copy count is above 500-1000), HLA-B5701 testing, the time between membrane rupture and birth, gestational age at birth, birth weight, route of delivery, 1 and 5 minute Apgar scores, admission to neonatal intensive care unit (NICU), intrapartum maternal viral load, intrapartum maternal retroviral therapy, accompanying disease, retroviral treatment received by the neonate,follow-up period of babies, mother's continuity of treatment were reported.

The patients were followed and treated by a multidisciplinary team consisting of a perinatologist, neonatologist, infectious disease specialist, pediatric infection specialist, and anesthesiologist.

The statistical analysis was performed by SPSS 22 (IBM Corp., NY). Kolmogrov-Smirnov test was used to assess whether the data is normally distributed. Mean and standard deviation values were used for normally distributed continuous variables. Whereas, median and range values were used to present continuous variables without normal distribution. Categorical variables were presented as numbers and percentages.

RESULTS

A total of 14HIV-positive pregnant women were included in the study. Prenatal demographic characteristics of HIV-positive pregnant women are summarized in Table 1. Sevenof the patients were Turkish citizens and the remaining 7 were immigrants. Fiveof the immigrants were from the break-up of the former Union of Soviet Socialist Republics and 2 were from Africa. Four of the immigrants were under regular medical check-ups, and three of them were not being followed up. The mean maternal age was 29.4±5.5 years. The median gravidity was 2 (range 1-4) and the median parity was 2 (range 0-3). The median time from the time of first diagnosis to the present was 4 (range 2-6) years. Four of the patients were smokers, and one of them had also used drugs in the past. Fivepatients were not given any hepatitis markers, the tests performed in the remaining 9 patients, results were negative in 8 patients, while 1 patient was found to be a Hepatitis B carrier. Twelveof the patients did not have an HPV DNA test, one of the 2 patients who had the test was negative, and the positive patient had multiple condylomas in the vulva and vagina.Latent tuberculosis was present in one patient. None of the patients underwent invasive diagnostic tests (amniocentesis, chorionic villus sampling).

Two cases (14.28%) were in the first trimester, one case (7.14%) was in the second trimester, 10 cases(71.42%) were in the third trimester, and one case (7.14%) was in the 10th postpartum day at first admission to hospital. Nine (64.3%) of the patients had regular hospital follow-ups and regular tests and treatment, while 5 (35.7%) did not attend regular follow-ups and did not receive

Table 1. Prenatal demographic characteristics of HIV-positive pregnant women (n=14)

Ethnicity	**Turkish**	**7(50%)**
	İmmigrants	**7(50%)**
First diagnosis time (years ago)		4 (range 2-6)
Maternal age		29.4±5.5
Gravidity		2 (range 1-4)
Parity		2 (range 0-3)
Smoking/drug abuse		4/1
Tuberculosis status		1
HPV DNA status	Not Tested	12
	Positive	1
	Negative	1
Hepatitis status	Not Tested	5
	Negative	8
	Positive	1
First admission	First trimester	2
	Second trimester	1
	Third trimester	10
	Postoperative	1
Regular follow-up visits and regular treatment intake	Yes	9 (64.3%)
	No	5 (35.7%)
CD4+ count		611±243
CD8+ count		852±366
CD4/CD8		0.94±0.74
Maternal HIV plasma RNA copies	Negative	5
	Positive	8
	Not Tested	1
WBC		8950±1030
AST / ALT		15.7±5.6 / 21.4±10.3
Urea / Creatinine		21.7±6.6 / 0..52±0.007

HIV: human immunodeficiency virus, HPV: Human papillomavirus, DNA: deoxyribonucleic acıd, RNA: Ribonucleic acid, WBC: white blood cell, AST: aspartate aminotransferase, ALT: alanine aminotransferase CD: cluster of differentiation

Table 2. Comparison of demographic and clinical characteristics of Turks and immigrants

Variables	Turkish (n=7)	Immigrants (n=7)	p
Age	28.71±2.19	29.0±1.09	0.74
Gravidity	2 (range 1-4)	2 (range 1-3)	0.63
Parity	2 (range 0-3)	1 (range 0-2)	0.37
ALT	20.14±2.52	31.5±8.77	0.31
AST	15±1.23	29.83±14	0.77
WBC	8.67±0.47	8.67±1.07	0.66
First diagnosis time (years ago)	4 (range 2-6)	3 (range 1-9)	0.93
First admission (weeks)	25.4±5.2	28.8±5.8	0.93
Urea	19.7±1.7	21±3.9	0.82
Creatinine	0.53±0.02	0.55±0.036	0.66
HIV RNA	12774±8231	21591±21242	0.9
CD8	845.4±180.5	738.5±165.2	0.8
CD4	718.4±85.2	420±86.7	0.1
APGAR 1st Minute	8 (range 7-8)	8 (range 7-8)	0.09
APGAR 5th Minute	9 (range 9-10)	9 (range 8-10)	0.66
Birth week	37.7±0.4	36.8±0.5	0.24
Birth weight (grams)	3095±104	2946±87	0.22

HIV: Human immunodeficiency virus, HPV: Human papillomavirus, DNA: deoxyribonucleic acıd, RNA: Ribonucleic acid, WBC: white blood cell, AST: aspartate aminotransferase, ALT: alanine aminotransferase CD: cluster of differentiation

regular treatment. The mean white blood cellcount (WBC) value at initial hospital admission was 8950±1030. The mean value of liver function tests at initial presentation was 15.7±5.6 IU/L for AspartateAminotransferase (AST) and 21.4±10.3 IU/L for Alanine Aminotransferase (ALT). The mean CD4+ count was 611±243 and the CD8+ count was 852±366. The mean CD4/CD8 ratio was 0.94±0.74.The maternal HIV plasma RNA copy numberwas not checked in one patient, the result was negative in 5 patients and was positive in the remaining 8 patients. The median HIV RNA was 471 copies/ml (range 0-106559).

Demographic and clinical characteristics of Turks and immigrant citizens were compared and summarized in Table 2. There were no significant differences in age, gravidity, parity, first diagnosis time and time since first diagnosis between the two groups. There were no significant differences between the two groups in terms of hemogram, liver function tests and kidney function test results. No significant difference was found when viral load, CD4 and CD8 counts were compared between the two groups. When the birth week, birth weight and Apgar scores were compared, no significant difference was found between the two groups.

Table 3. Intrapartum and short-term postnatal findings (0-7 days)

Gestational age at birth (weeks)		37.1±1.3
Ruptures of membranes	Yes	3
	No	11
Delivery type	Vaginal birth	1
	Cesarean birth	13
Cesarean section indications	HIV posivitiy, primigravid	6
	HIV positivity, previous cesarean section	7
Birth weight (grams)		2982±301
APGAR 1st minute (mean)		7 (range 7-8)
APGAR 5th minute (mean)		9 (range 8-10)
NICU admission	Yes	6
	No	8
Intrapartum treatment	Retroviral therapy	6
	Effective combined retroviral therapy	8

HIV: human immunodeficiency virus, NICU: neonatal intensive care unit

Table 4. Long-term outcomes of babies born to HIV-positive mothers

0-18 months	5
18-40 months	9
Treatment given	lamivudine/zidovudine and raltegravir
HIV positivity after 18 months	0

Intrapartum and short-term postnatal findings (0-7 days) are summarized in Table 3. At the time of delivery, eight of the pregnant women were already receiving effective combined antiretroviral therapy (ART), while 6 were untreated and antiretroviral therapy was started at that time.The mean gestational age at birth was 37.1±1.3 weeks. Three patients had membrane rupture, membranes were intact in 11 patients. 13 of the patients gave birth by cesarean section, and one by spontaneous vaginal birth.Of the patients who had a cesarean section, 7 of them were performed because they had a previous cesarean section, and 6 of them were performed because it was their first HIV-positive pregnancy. The mean birth weight of the infants was 2982±301 grams.The first-minute median APGAR score was 7 (range 7-8) and the fifth-minute median APGAR score was 9 (range 8-10). Six infants were followed up in the neonatal intensive care unit and 8 infants did not need the neonatal intensive care unit.The reason for follow-up in the intensive care unit was temporary tachypnea of the newborn.

Long-term outcomes of babies born to HIV-positive mothers are summarized in Table 4. Since the infants were born at different times, they were divided into 2 groups: 0-18 months and 18-40 months. All babies were regularly followed up by a pediatrician and an infectious disease specialist. All infants were given standard treatment with lamivudine/zidovudine and raltegravir.HIV positivity was not detected in any of the babies in the controls performed after 18 months.

DISCUSSION

Perinatal outcomes are generally favorable according to the results of the present study, although one-third of the cases had irregular antenatal follow-up. Due to the advances in the field of antiretroviral therapy and increasing knowledge among physicians, the management of pregnant women with HIV is not a nightmare anymore.

In a retrospective study including 258 HIV-positive and 258 HIV-negative pregnant women, maternal and fetal outcomes were compared. Adverse pregnancy outcomes such as anemia, puerperal sepsis, and low birth weight were significantly higher in the HIV-positive group. Cesarean delivery was found to be higher in the HIV-positive group compared to the control group. Preterm delivery rates were found to be higher in the HIV group who did not receive anti-retroviral treatment.The study concluded that HIV-positive status increased adverse outcomes and antiretroviral therapy decreased the risk of preterm labor (13).

In a cohort study involving 249 HIV-positive pregnant women, adverse outcomes were evaluated. The study compared two groups of patients who received HAART treatment from early weeks and patients who did not receive HAART during pregnancy but received nevirapineintrapartum.The rate of preterm delivery, fetal growth restriction, and cesarean delivery was significantly higher in the group not receiving treatment compared to the group receiving treatment.In the untreated group, the frequency of low birth weight (less than 2500 grams), 5th-minuteAPGAR score less than 7, and admission to the neonatal unit were higher. Education level was significantly lower in the group that did not receive treatment. In the study, it was concluded that adverse outcomes may be higher in the group that did not receive treatment, they benefited less from the health system due to low education level and could not benefit from early HAART treatment (14).

In a retrospective case-control study including 62 HIV-positive and 100 HIV-negative pregnant womenpregnancy outcomes were compared.HIV-positive women were found to be younger in age and had lower mean parity than the control group. In addition, the HIV-positive group had higher positive syphilis serology, longer mean duration of labor, perineal tear, puerperal sepsis, and higher mean length of hospital stay, rates of low birth weight, birth asphyxia, neonatal intensive care unit hospitalization were higher in the HIV positive group.However, no significant difference was found between the two groups in terms of recurrent vulvovaginitis, hepatitis B surface antigenemia, stillbirth, congenital anomaly, miscarriage, preterm delivery, mode of delivery, rupture of membranes, and mean time between delivery.In the study, it was concluded that adverse pregnancy outcomes were high in HIV-positive patients who did not receive treatment (15).

In a single-center retrospective study including 105 patients, perinatal outcomeswere evaluated in adolescent HIV-positive pregnancies.In the HIV-positive adolescent group, higher rates of perinatal acquired HIV infection, higher duration of HIV infection, and longer duration of antiretroviral therapy were found. Preterm delivery and low birth weight were higher in adolescent HIV-positive pregnant women compared to healthy pregnant womenthan in adolescent HIV-negative healthy controls. The rates of preeclampsia and preterm labor were similar between HIV-positive and HIV-negative adolescent groups. The study concluded that adolescent

HIV-positive pregnant women were at higher risk of adverse perinatal outcomes compared with HIV-negative adolescent women, but were comparable to adult HIV-positive pregnant women (16).

A retrospective single-center study evaluated the uptake of preventive interventions to prevent transmission from HIV-positivemothers to infants. The study evaluated 542 HIV-positive living mothers and 551 infants born to these mothers. The majority of mothers (95.5%) were receiving antiretroviral therapy before delivery, had a viral copy number less than 1000, and 65% were receiving intrapartum zidovudine. The majority of HIV-exposed infants were in the low-risk group (82.6%) and received postnatal antiretroviral treatment (98.9%). Among low-risk infants, 53.2% were born by cesareans. Among high-risk infants, 84.4% were delivered by cesarean section, 78.1% received intrapartum zidovudine and 62.5% received antiretroviral combination therapy. A section and received intrapartum (62.9%) and postpartum (96.5%) zidovudine treatment. Nineinfants from the high-risk group were infected with HIV (17).

A retrospective single-center study included 138 patients and described the steps to prevent vertical transmission. HIV diagnosis was mostly (73.5%) made during pregnancy and 50.7% of patients had been receiving retroviral therapy for at least 6 months. Seven percent were diagnosed at the time of delivery. Opportunistic infection developed in 10 patients. Five patients had pulmonary tuberculosis, and 3 patients hadoral candidiasis.One patient had CMV infection and one patient had molloscum contagiosum. Unfortunately, data on maternal CD4+ count and viral load were mostly (78% and 84%) unavailable. Thirty patients were examined for CD4+ count; 8 were found to be less than 200, 22 patients were examined for viral load and 6 were found to be more than 400. Seventy-two percent of babies were born with a normal birth weight (2500-3500 grams).Almost all infants received antiretroviral prophylaxis (97.9%) and formula feeding. PCR HIV was analyzed in 16 infants at 6 weeks of age and 13 infants at 6 months of age. There was 1 infant with viral load results >400 copies/ml. Maternal CD4 levelswere not significantly correlated with neonatal virology status. This study concluded that HIV diagnosis is important because starting antiretroviral therapy in the first weeks of pregnancy is important in preventing vertical transmission(18).

Meticulous follow-up, strict compliance with antiretroviral therapy, providing emotional support for the mother, a multidisciplinary approach, and appropriate management of labor are the key steps in achieving favorable outcomes in pregnancies complicated with HIV. Thus, pregnant women with HIV should be followed up in tertiary reference centers with a high level of experience. Although formerly regarded as a deadly disease in the past decades, promising advances in pharmacy therapy have increased life expectancy and quality of life in patients living with HIV. Moreover, antiretroviral therapy and proper management of labor have substantially decreased vertical transmission of HIV in pregnant individuals. For this reason, obstetricians may encourage pregnancy in women with HIV positivity. However, physicians should be cautious about the higher risk of obstetric complications. Additionally, HIV positivity is reported to be higher in handicapped populations like immigrants, sex workers, drug users, and minorities. This situation brings together other risk factors like sexually transmitted diseases, poor nutrition, partner violence, social isolation, opportunistic infections, and low compliance with antiretroviral therapy. Thus, management of pregnant women with HIV is a challenging issue and a comprehensive clinical protocol should be formed by health authorities.

The main strength of the present study is the relatively high number of parameters. Single-center experience and a low number of participants are the main limitations.

In conclusion, maternal HIV infection is associated with favorable outcomes if managed appropriately by a multidisciplinary team.

REFERENCES

1. Govender RD, Hashim MJ, Khan MA, Mustafa H, Khan G. Global epidemiology of HIV/AIDS: a resurgence in North America and Europe. Journal of epidemiology and global health. 2021;11(3):296.
2. De Cock KM, Fowler MG, Mercier E, De Vincenzi I, Saba J, Hoff E, et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. Jama. 2000;283(9):1175-82.
3. Kalish LA, Pitt J, Lew J, Landesman S, Diaz C, Hershow R, et al. Defining the time of fetal or perinatal acquisition of human immunodeficiency virus type 1 infection on the basis of age at first positive culture. Journal of Infectious Diseases. 1997;175(3):712-5.
4. Lee T-H, Chafets DM, Biggar RJ, McCune JM, Busch MP. The role of transplacental micro-transfusions of maternal lymphocytes in in utero HIV transmission. Journal of acquired immune deficiency syndromes (1999). 2010;55(2):143.
5. Fawzi W, Msamanga G, Spiegelman D, Renjifo B, Bang H, Kapiga S, et al. Transmission of HIV-1 through breastfeeding among women in Dar es Salaam, Tanzania. Journal of acquired immune deficiency syndromes (1999). 2002;31(3):331-8.
6. Garcia PM, Kalish LA, Pitt J, Minkoff H, Quinn TC, Burchett SK, et al. Maternal levels of plasma human immunodeficiency virus type 1 RNA and the risk of perinatal transmission. New England Journal of Medicine. 1999;341(6):394-402.
7. Townsend CL, Cortina-Borja M, Peckham CS, de Ruiter A, Lyall H, Tookey PA. Low rates of mother-to-child transmission of HIV following effective pregnancy interventions in the United Kingdom and Ireland, 2000–2006. Aids. 2008;22(8):973-81.
8. Health UDo, Services H. Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission. Recommendations for the use of antiretroviral drugs during pregnancy and interventions to reduce perinatal HIV transmission in the United States. 2022.

9. Fowler MG, Qin M, Fiscus SA, Currier JS, Flynn PM, Chipato T, et al. Benefits and risks of antiretroviral therapy for perinatal HIV prevention. New England Journal of Medicine. 2016;375(18):1726-37.

10. Jackson JB, Musoke P, Fleming T, Guay LA, Bagenda D, Allen M, et al. Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: 18-month follow-up of the HIVNET 012 randomised trial. The Lancet. 2003;362(9387):859-68.

11. Hoffman RM, Black V, Technau K, van der Merwe KJ, Currier J, Coovadia A, et al. Effects of highly active antiretroviral therapy duration and regimen on risk for mother-to-child transmission of HIV in Johannesburg, South Africa. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2010;54(1):35-41.

12. Lallemant M, Jourdain G, Le Coeur S, Kim S, Koetsawang S, Comeau AM, et al. A trial of shortened zidovudine regimens to prevent mother-to-child transmission of human immunodeficiency virus type 1. New England Journal of Medicine. 2000;343(14):982-91.

13. Ikpim EM, Edet UA, Bassey AU, Asuquo OA, Inyang EE. HIV infection in pregnancy: maternal and perinatal outcomes in a tertiary care hospital in Calabar, Nigeria. Tropical doctor. 2016;46(2):78-86.

14. Joseph O, Biodun O, Michael E. Pregnancy outcome among HIV positive women receiving antenatal HAART versus untreated maternal HIV infection. J coll physicians surg Pak. 2011;21(6):356-9.

15. Onah H, Obi S, Agbata T, Oguanuo T. Pregnancy outcome in HIV-positive women in Enugu, Nigeria. Journal of Obstetrics and Gynaecology. 2007;27(3):271-4.

16. Osmundo Junior GdS, Cabar FR, Peres SV, Waissman AL, Galletta MAK, Francisco RPV. Adverse Perinatal Outcomes among Adolescent Pregnant Women Living with HIV: A Propensity-Score-Matched Study. International Journal of Environmental Research and Public Health. 2023;20(8):5447.

17. Koay WLA, Zhang J, Manepalli KV, Griffith CJ, Castel AD, Scott RK, et al. Prevention of perinatal HIV transmission in an area of high HIV prevalence in the United States. The Journal of pediatrics. 2021;228:101-9.

18. Indarti J, Yunihastuti E, Kurniati N, Aprilia B, Pamungkas DT, Chiprion AT, et al. Pregnancy Profile and Infant Outcomes Among HIV Infected Women Who Delivered in Cipto Mangunkusumo Hospital. Acta Med Indones. 2020;52(1):55-62.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Servikal eksizyonel işlemde çıkarılan spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlığı, doğum haftası, obstetrik komplikasyonlar ve gebelikteki maternal hastalıklar arasındaki ilişkinin incelenmesi

Examination of the relationship between the ectocervical surface area of the specimen extracted in cervical excisional procedure and infant birth weight, birth week, obstetric complications and maternal diseases in pregnancy

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ÖZ

Amaç: Bu çalışmada servikal eksizyonel işlem sonrası gebelik geçiren hastaların sadece çıkarılan spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlığı, doğum haftası, obstetrik komplikasyonları ve gebelikteki maternal hastalıklar arasındaki ilişkisini görmeyi amaçlıdık.

Gereç ve Yöntemler: Çalışmaya eksizyonel işlem öncesinde doğum yapan 27 hasta ve doğum yapmamış 25 hasta dahil edildi. Analizler SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22 paket programında değerlendirildi.

Bulgular: Çıkarılan ektoservikal yüzey alanı ile işlem öncesi doğum yapmış olan hastalarda doğum haftaları arasında ve işlem öncesi doğum yapmamış hastalarda servikal yetmezlik açısından orta düzeyde korelasyon saptandı (sırasıyla r= -0,312,r= 0,319), ancak sonuçlar anlamlı değildi (p= -0,312,p= 0,319). Eksizyonel işlemden önce ve sonrasındaki bebek doğum ağırlıklarının, çıkarılan ektoservikal yüzey alanı ile ilişkisi saptanmadı (r= -0,083, p= 0,680). Sadece eksizyonel işlem sonrası doğum yapmış olan hastalarda ise, eksizyonel işlem spesmenin ektoservikal yüzey alanı ile doğumdaki bebek ağırlığı arasında orta düzeyde korelasyon saptandı(r=0,447),aralarında anlamlı ilişki saptandı (p= 0,025).

Sonuç: Sadece eksizyonel işlem sonrası doğum yapmış hastalarda; çıkarılan ektoservikal yüzey alanı ile term doğumdaki bebek ağırlığı arasında saptadığımız orta düzeydeki korelasyon ve anlamlı ilişkiyi destekleyecek düzeyde literatürde çalışma yoktur.Termdeki doğumlarda servikal stenozun doğum eylemini geciktirebileceği ilgili çalışmalar olsa da bu durumun toplamda bebek doğum ağırlığını arttırdığı gösterilmemiştir. Hasta sayısının az olması ve veri erişimindeki yetersizlikler çalışmamızı kısıtlamıştır. Çıkarılan materyalin ektoservikal yüzey alanı ile sonraki gebeliklerdeki neden olduğu klinik sonuçların ortaya konulabilmesi için daha kapsamlı çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Servikal eksizyonel işlem, ektoservikal yüzey alanı, doğum ağırlığı

ABSTRACT

Aim: The purpose of this study was to determine if there was a relation between the ectocervical surface area of the extracted specimen and infant birth weight, birth week, obstetric complications, and maternal diseases during the pregnancy period following the cervical excisional procedure.

Materials and Methods: The study included 27 patients who gave birth prior to the excisional procedure and 25 patients who did not give birth. The analyses were evaluated in SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22 package program. Results: A moderate correlation in terms of cervical insufficiency was detected between the extracted ectocervical surface area and the birth weeks in patients who gave birth prior to the procedure, and in patients who did not give birth prior to the procedure (r= -0.312, r= 0.319, respectively), but the results were not substantial (p= -0.312, p= 0.319). Any relationship was not detected between the birth weights of the babies before and after the excisional procedure and the extracted ectocervical surface area (r= -0.083, p= 0.680). In patients who gave birth only after the excisional procedure, a moderate correlation was detected between the ectocervical surface area of the excisional procedure specimen and the weight of the baby at birth (r= 0.447), and an important relationship was detected between them (p= 0.025).

Conclusion: There is no study in the literature to support the moderate correlation and significant relationship we found between the ectocervical surface area extracted and the weight of the baby at term birth in patients who gave birth only after an excisional procedure. Although there have been studies that have demonstrated cervical stenosis can cause labor to be delayed in term births, it has not been proven that this situation increases the total birth weight of the baby. The limited number of patients and inadequate data access have restricted our study. More extensive studies are required to reveal the ectocervical surface area of the extracted material and the clinical outcomes it causes in subsequent pregnancies.

Keywords: Cervical excisional procedure, ectocervical surface area, birth weigh

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GİRİŞ

Servikal intraepitelyal neoplazi (CIN) serviksin premalign halidir. Servikal preinvaziv lezyonlardan CIN 2 ve CIN 3 yüksek grade lezyonlar olarak kabul edilmektedir.CIN insidansı kadınlar arasında özellikle reprodüktif yaş döneminde en fazla seviyededir. CIN 1 lezyonların çoğu spontan regresyon olurken, tedavi edilememiş CIN3 lezyonları %40'a varan oranlarda invaziv kansere invaziv kansere dönüşebilmektedir (1).

Yüksek gradeli servikal skuamöz intraepitelyal neoplaziler kriyoterapi ve lazer ablasyon gibi ablatif tedavilerle ya da soğuk konizasyon, lazer konizasyon ve Loop Elektrocerrahi Eksizyonel Prosedür (LEEP) gibi eksizyonel tedavi şekilleri ile yönetilebilmektedir. Konizasyon serviks yüzeyinden servikal kanala doğru serviksin koni şeklinde çıkarılmasını ifade etmektedir ve LEEP'e göre daha iyi küratif sonuçlar sağlamaktadır (2). LEEP, servikal dokunun 6-10 mm derinliğe kadar çıkarıldığı dolayısı ile konizasyona göre daha az endoservikal kanal çıkarıldığı bir cerrahi prosedürdür .Konizasyon ve LEEP tanı için yeterli materyal ile beraber sağlamakla birlikte,aynı zamanda hastaya tedavi olananağı da sağlamaktadır.

Servikal konizasyon ilk olarak 1815 yılında Lisfranc tarafından tanımlanmıştır .O zamandan itibaren araştırmacılar konizasyon sonrası gebelik sonuçları için çok farklı sonuçlara ulaşmıştır (3). Bir meta-analizde 19 retrospektif ve 1 prospektif kohort çalışma değerlendirilmiş. Soğuk konizasyon artmış perinatal mortalite, artmış erken doğum riski, artmış düşük doğum ağırlığı riski ile ilişkili bulunmuştur (4). Jonathan ve arkadaşları da yaptıkları çalışmada LEEP olduktan sonra gerçekleşen 20 haftanın üzerindeki gebeliklerde erken doğum, erken membran rüptürü ve düşük doğum ağırlığında olan bebek riskinin arttığını bildirmiştir (5).

Servikal intraepitelyal neoplazi tanı ve tedavi prosedürlerinin doğru bir şekilde yapılması, preterm doğum ve diğer olumsuz gebelik sonuçları başta olmak üzere halk sağlığı için önemlidir. Bu çalışmada servikal eksizyonel işlem sonrası gebelik geçiren hastaların,eksizyonel işlemde çıkarılan spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlığı, doğum haftası, obstetrik komplikasyonları ve gebelikteki maternal hastalıklar arasındaki ilişkiyi araştırmayı amaçlıyoruz.

GEREÇ VE YÖNTEMLER

Çalışmanın T.C Sağlık Bakanlığı Sağlık Bilimleri Üniversitesi Gülhane Tıp Fakültesi Dekanlığı 13/10/2022 tarihli E-86241737-100-174782 sayılı belgedeki Tıpta Uzmanlık Etik Kurulu (TUEK) kararı ve T.C Sağlık Bilimleri Üniversitesi Ankara Şehir Hastanesi E2-22-2477 no'lu 28/09/2022 tarihli 2 No'lu Etik Kurul onayı mevcuttur. Çalışmamız Ankara Bilkent Şehir Hastanesi'nde retrospektif olarak yapılmıştır. 2009-2022 yılları arasında Dr. Zekai Tahir Burak Hastanesi'nde veya Ankara Bilkent Şehir Hastanesi'nde konizasyon yada LEEP yapılan ve sonrasında gebelik geçiren 65 hastanın Ankara Bilkent Şehir Hastanesi veri tabanı sistemine (HICAMP) aktarılan verilerinden, onayı olan hastaların e-nabız bilgilerinden ve telefonla görüşme sağlanarak ile bilgileri elde edildi. Çalışmamız Helsinki Deklarasyonu prensiplerine uygunluk gösternektedir ve hastalardan "bilgilendirilmiş olur (rıza)" alınmıştır.

Eksizyonel işlem öncesi ve sonrasında en az bir viable gebeliği olan ilk grupta ve eksizyonel işlem öncesi doğumu olmayan sadece eksizyonel işlem sonrası viable gebeliği olan ikinci grupta bebek doğum ağırlıkları, annenin doğumdaki beden kitle endeksleri [BMI, kilogram/metrekare (kg/m^2)], doğum haftaları, doğum sonrası yenidoğan problemleri (solunum sıkıntısı, konjenital anomali, hiperbilirubinemi), gebelikteki obstetrik problemleri (postoperatif/postpartum enfeksiyon, fetal distress, erken membran rüptürü, plasenta dekolmanı, sefalopelvik uyumsuzluk, prematür erken membran rüptürü) ve gebelikteki maternal hastalıklar (idraryolu enfeksiyonu, vaginit, hipertansiyon, gestasyonel diyabet, kolestaz, hipotiroidi) ile eksizyonel işlemde çıkarılan materyalin ektoservikal yüzey alanının korelasyonu yapıldı. Ektoservikal yüzey alanı korelasyonu dışında çıkarılan ektoservikal spesmenin endoservikal kanal uzunluğunun ölçümü ve çıkarılan spesmenin hacim değerlendirmesi yapılmadı. Korelasyonlar sadece çıkarılan materyalin ektoservikal yüzey alanı ile yapıldı. Eksizyonel işlem sonrası bebek kalp atışı görüldükten sonra abort eden ya da yasal tahliye olan 13 hastanın verileri net değildi. Bu hastalar çalışmaya dahil edilmedi.

Preterm eylem gibi obstetrik feto-maternal komplikasyon oranını arttırabilecek diğer nedenleri barındıran hastalar çalışmaya dahil edilmedi.

Ektoservikal yüzey alanı hesaplanmasında çıkarılan spesmen çoğu kez tam bir daire şeklinde olmadığı için spesmenin eni ve boyu toplamının yarısı ortalama spesmen çapı (R) olarak kabul edildi. Pi sayısını (π) yaklaşık 3,14 olarak aldığımızda ektoservikal yüzey alanı = $\pi x r^2$ formülü ile milimetrekare (mm^2) cinsinden hesaplandı.Analizler SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22 paket programında değerlendirilmiştir. Çalışmada tanımlayıcı veriler kategorik verilerde n, % değerleri, sürekli verilerde ise ortalama±standart sapma (Ort±SS) değerleri ile gösterilmiştir. Sürekli değişkenlerin normal dağılıma uygunluğu Kolmogorov-Smirnov testi ile değerlendirilmiştir. Değişkenler arası ilişkilerin yönünü ve derecesini tanımlamak için spearman korelasyon analizi kullanıldı. Eksizyonel işlem öncesi ve sonrası

ölçümsel verileri kıyaslamak için Wilcoxon analizi, kategorik verileri karşılaştırma için ise McNemar analizi uygulanmıştır. Analizlerde istatistiksel anlamlılık düzeyi p<0,05 olarak kabul edildi.

BULGULAR

Eksizyonel işlem öncesi ve sonrasında en az birer doğumu olan ilk gruptaki 27 hastanın 17'sine (%63) soğuk konizasyon ve 10'una (%37) LEEP konizasyon uygulanmıştır. Hastaların eksizyonel işlemde çıkarılan spesmenin ektoservikal yüzey alanı ortalaması 291,67±148,84 mm² iken eksizyonel işlemde yaş ortalaması ise 34,12±3,51 yıl şeklindedir (Tablo 1). Hastaların gravida sayısı ortalaması 3,56±1,34, parite ortalaması 3,19±1,04, normal doğum sayısı 2,81±1,33 ve sezaryen ortalaması 0,37±0,84 olarak bulunmuştur.

Eksizyonel işlemden önceki doğumlarda anne BMI ortalaması 26,11±4,65 kg/m² iken sonraki doğumlarda 29,26±4,14 kg/m² olarak saptandı. Eksizyonel işlemden önceki ve sonraki doğumlarda annenin doğumdaki BMI farkları arasında istatistiksel olarak anlamlı farklılık tespit edildi (p=0,001). Eksizyonel işlemden önceki doğumlarda ortalama doğum haftası 38,81±1,37 iken eksizyonel işlemden sonraki doğumlarda ortalama doğum haftası 37,86±2,89 olarak saptandı. Doğum haftaları arasında istatistiksel olarak anlamlı bir farklılık yoktu (p=0,298). Eksizyonel işlemden önceki doğumlarda ortalama bebek ağırlığı 3264,63±556,11 gr iken sonraki doğumdarda 3122,56±435,30 gr olarak saptandı. Eksizyonel işlemden önceki ve sonraki doğumlarda bebek ağırlıkları arasında istatistiksel olarak anlamlı farklılık tespit edildi(p=0,001).

Tablo 1. Eksizyonel işlemden önce ve sonra doğum yapmış olan hastaların ve sadece eksizyonel işlem sonrasında doğum yapmış hastaların demoğrafik ve klinik özellikleri.

Fakörler	Eksizyonel işlemden önce de doğum yapmış hastalar	Sadece eksizyonel işlemden sonra doğum yapmış hastalar
Hasta sayısı	27	25
Konizasyon/LEEP	17/10	12/13
Eksizyonel işlem yaşı	33,07±4,72	30,32±5,18
Doğumdaki yaşı	34,12±3,51	33,81±5,03
Annenin doğumda BMI (kg/m²)	29,26±4,14	25,75±3,61
Doğum haftası	37,86±2,89	37,75±3,61
Bebek ağırlığı (gr)	3122±435	3316±744
Prematürite	%22,2	%28
Düşük doğum ağırlığı	%7,4	%16
Servikal yetmezlik	%3,7	%12
Yenidoğan hastalıkları	%7,4	%12
Obstetrik komplikasyonlar	%22,2	%20
Maternal hastalıklar	%48,1	%40

Eksizyonel işlemden önce 4 hastada (%14,8) abortus öyküsü var iken eksizyonel işlemden sonraki gebeliklerde 9 hastada abortus görüldü. Abortus sayıları arasında istatistiksel olarak anlamlı bir farklılık yoktu (p= 0,157). Abortus ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= 0,193). Eksizyonel işlemden önce 2 hastada ektopik gebelik öyküsü var iken, eksizyonel işlemden sonraki gebeliklerde 5 hastada ektopik gebelik görüldü. Ektopik gebelik sayıları arasında istatistiksel olarak anlamlı bir farklılık yoktu (p=0,317). Ektopik gebelik ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r=0,112).

Eksizyonel işlemden önce doğan 3 bebekte (%11,1) prematürite var iken eksizyonel işlemden sonra doğan 6 bebekte (%22,2) prematürite görüldü. Prematürite sayıları arasında istatistiksel olarak anlamlı bir farklılık yoktu (p= 0,508). Prematürite ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= -0,058). Eksizyonel işlemden önce doğan 3 bebekte (%11,1) düşük doğum ağırlığı var iken eksizyonel işlemden sonra doğan 2 bebekte (%7,4) düşük doğum ağırlığı görüldü. Düşük doğum ağırlığı sayıları arasında istatistiksel olarak anlamlı bir farklılık yoktu (p= 0,879). Düşük doğum ağırlığı ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= 0,069). Eksizyonel işlemden önceki gebeliklerde 1 hastada (%3,7) servikal yetmezlik var iken,eksizyonel işlemden sonraki gebeliklerde 3 hastada (%11,1) servikal yetmezlik görüldü. Servikal yetmezlik sayıları arasında istatistiksel olarak anlamlı bir farklılık yoktu (p= 0,625). Servikal yetmezlik ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r=0,099), (Tablo 1,Tablo 2).

Eksizyonel işlem öncesi doğum yapmış olan ilk hasta grubunda, spesmenin ektoservikal yüzey alanı ile doğumdaki anne BMI'leri arasında korelasyon saptanmadı (r=0,014), aynı zamanda spesmenin ektoservikal yüzey alanı ile doğumdaki anne BMI'leri arasında da anlamlı ilişki saptanmadı (p= 0,945). Eksizyonel işlem öncesi doğum yapmış olan ilk hasta grubunda, spesmenin ektoservikal yüzey alanı ile doğum haftaları arasında orta derecede negatif korelasyon saptandı (r=-0,312) ancak spesmenin ektoservikal yüzey alanı ile doğum haftaları arasında ise anlamlı ilişki saptanmadı (p=0,113). Eksizyonel işlem öncesi doğum yapmış olan ilk hasta grubunda, spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlıkları arasında korelasyon saptanmadı

(r=-0,083) aynı zamanda spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlıkları arasında da anlamlı ilişki saptanmadı (p=0,680). (Tablo 1,Tablo 2)

Eksizyonel işlemden önce doğan 2 bebekte (%7 yenidoğan hastalığı (1solunum sıkıntısı, 1 konjenial anomali) var iken eksizyonel işlemden sonra doğan 2 bebekte de (%7) yenidoğan hastalığı (1 solunum sıkıntısı , 1 hiperbilirubinemi) görüldü. Yenidoğan hastalığı sayıları arasında anlamlı farklılık tespit edilmedi (p=0,998). Yeni doğan hastalıkları ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r=-0,076). Eksizyonel işlemden önce doğan 3 bebekte (%11,1) obstetrik problem (1 erken membran rüptürü , 1 sefalopelvik uyumsuzluk, 1 prematür erken membran rüptürü) var iken eksizyonel işlemden sonra doğan 6 bebekte (%22,2) obstetrik problem (1 postpartum enfeksiyon, 2 fetal distres, 1 plasenta dekolmanı, 2 prematür erken membran rüptürü) saptandı. Obstetrik problem sayıları arasında anlamlı farklılık tespit edilmedi (p= 0,453). Obstetrik problemler ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= 0,098). Eksizyonel işlemden önce 9 hastada (%33,3) maternal hastalık var iken eksizyonel işlemden sonra 13 hastada (%48,1) maternal hastalık görüldü. Maternal hastalık sayıları arasında anlamlı farklılık tespit edilmedi (p=0,125). Maternal hastalıklar ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r=0,012), (Tablo 1,Tablo 2).

Tablo 2. Eksizyonel işlem öncesinde doğum yapanve yapmayan hastalarda,eksizyonel işlem sonrası gebeliklerine ait klinik özelliklerin, spesmenin ektoservikal yüzey alanı ile korelasyon ve anlamlılık değerleri.

	Eksizyonel işlem öncesinde de doğum yapmış hastalar		**Sadece eksizyonel işlem sonrası doğum yapmış hastalar**	
Klinik	Ektoservikal yüzey alanı		Ektoservikal yüzey alanı	
	r	**p**	**r**	**p**
Anne BMI	0,014	0,945	0,224	0,114
Doğum haftası	-0,312	0,113	-0,047	0,825
Bebek ağırlığı (gr)	-0,083	0,680	0,447	0,025
Prematürite	-0,058	0,508	0,198	0,625
Düşük doğum ağırlığı	0,069	0,879	-0,119	0,518
Servikal yetmezlik	0,099	0,625	0,319	0,367
Yenidoğan hastalıkları	-0,076	0,998	0,098	0,433
Obstetrikkomplikasyon	0,098	0,453	-0,153	0,189
Maternal hastalıklar	0,012	0,125	0,079	0,302

Spearman korelasyon analizi (***r***= korelasyon, ***p***= anlamlılık)

Sadece eksizyonel işlem sonrası gebeliği olan ikinci gruptaki 25 hastanın gravida sayısı ortalaması 2,04±1,49, parite ortalaması 1,44±,77 , normal doğum sayısı 0,76±0,93, sezaryen ortalaması ise 0,76±0,93 ve abortus sayısı ortalaması 0,48±1,08 olarak bulunmuştur. Sadece eksizyonel işlem sonrası gebeliği olan kadınların 4'ünde (%16) servikal yetmezlik riski saptanmış bu hastaların 2'sine (%8) serklaj yapıldığı görülmüştür. Kadınların 12'sine (%48) soğuk konizasyon 13'üne ise (%52) LEEP yapılmıştır. Kadınların 12'si (%48) sigara kullanmaktadır. Sadece eksizyonel işlem sonrası gebeliği olan kadınların eksizyonel işlem yaş ortalaması 30,32±5,18 yıl, doğum yaşı ortalaması 33,81±5,03 yıl, eksizyonel işlem yaşı ile doğum yaşı arasında geçen süre ortalama 3,49±2,90 yıl idi. Eksizyonel işlem spesmenin ektoservikal yüzey alanı ortalaması 271,76±226,54mm^2, doğumdaki anne BMI ortalaması 25,75±3,61 kg/m^2, doğum haftası ortalaması 37,75±3,61 ve doğum ağırlığı ortalaması 3316,00±744,52 gr olarak bulunmuştur (Tablo 1).

Sadece eksizyonel işlem sonrası doğum hastalara ait 7 bebekte (%28) prematürite görüld. Prematürite ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r=0,198). Spesmenin ektoservikal yüzey alanı ile prematürite arasında ise anlamlı ilişki saptanmadı (p=0,625). Sadece eksizyonel işlem sonrası doğum hastalara ait 4 bebekte (%16) düşük doğum ağırlığı görüldü. Düşük doğum ağırlığı ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= -0,119). Spesmenin ektoservikal yüzey alanı ile düşük doğum ağırlığı arasında ise anlamlı ilişki saptanmadı (p=0,518). Sadece eksizyonel işlem sonrası doğum hastalara ait 3 hastada (%12) servikal yetmezlik görüldü. Servikal yetmezlik ile spesmenin ektoservikal yüzey alanı arasında orta derecede korelasyon saptandı (r=0,319). Spesmenin ektoservikal yüzey alanı ile servikal yetmezlik arasında ise anlamlı ilişki saptanmadı (p=0,367), (Tablo 1,Tablo 2).

Sadece eksizyonel işlem sonrası doğum yapmış olan ikinci hasta grubunda, eksizyonel işlem spesmenin ektoservikal yüzey alanı ile annenin doğumdaki BMI arasında korelasyon saptanmadı (r=0,224) aynı zamanda spesmenin ektoservikal yüzey alanı ile annenin doğumdaki BMI arasında anlamlı ilişki saptanmadı(p=0,114). Sadece eksizyonel işlem sonrası doğum yapmış olan ikinci hasta grubunda, eksizyonel işlem spesmenin ektoservikal yüzey alanı ile doğum haftası arasında korelasyon saptanmadı (r=-0,047) aynı zamanda eksizyonel işlem spesmenin ektoservikal yüzey alanı ile doğum haftası arasında da anlamlı ilişki saptanmadı (p=0,825). Sadece eksizyonel işlem sonrası doğum yapmış olan ikinci hasta grubunda, eksizyonel işlem spesmenin ektoservikal yüzey alanı ile doğumdaki bebek ağırlığı arasında orta düzeyde pozitif korelasyon saptandı (r= 0,447), aynı zamanda eksizyonel işlem spesmenin ektoservikal yüzey alanı ile doğumdaki bebek ağırlığı arasında da anlamlı ilişki saptandı (p=0,025), (Tablo 1,Tablo 2).

Sadece eksizyonel işlem sonrası doğum hastalara ait 3 bebekte de (%12) yenidoğan hastalığı(1 solunum sıkıntısı ,1 hiperbilirubinemi,1 konjenital anomali) görüldü. Yeni doğan hastalıkları ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= 0,098). Spesmenin ektoservikal yüzey alanı ile yenidoğan hastalığı arasında ise anlamlı ilişki saptanmadı (p= 0,433). Sadece eksizyonel işlem sonrası doğum hastalara ait 2 bebekte (%8) obstetrik problem (1 Fetal distress 1 postpartum enfeksiyon) saptandı. Obstetrik problemler ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= -0,153). Spesmenin ektoservikal yüzey alanı ile obstetrik problem arasında ise anlamlı ilişki saptanmadı (p= 0,189). Sadece eksizyonel işlem sonrası doğum hastalara ait 11 hastada (%44) maternal hastalık görüldü. Maternal hastalıklar ile spesmenin ektoservikal yüzey alanı arasında korelasyon saptanmadı (r= 0,079). Spesmenin ektoservikal yüzey alanı ile maternal hastalık arasında ise anlamlı ilişki saptanmadı (p=0,302), (Tablo 1,Tablo 2).

TARTIŞMA

Serviks kanseri kadınlar arasındaki en ölümcül kanserlerdendir. Sitolojik tarama testleri, kolposkopik muayene ve serviks biyopsilerinin yaygınlaşması ile servikal intraepitelyal neoplazilerin (CIN) erken tanı ve tedavisi mümkün hale gelmiş, bu sayede serviks kanserinden ölüm oranları azalmıştır. Üreme çağındaki genç kadınlarda tespit edilen yüksek riskli servikal preinvaziv lezyonların tanı ve tedavisine yönelik uygulanan cerrahi yöntemlerin, serviksin normal anatomik-fonksiyonel yapısında kayba neden olarak hastanın sonraki gebeliklerinde kötü obstetrik sonuçlara neden olabildiğini gösteren çalışmalar artmaktadır. Bu nedenle serviks kanserinin öncül lezyonlarını erken tanımak ve bu lezyonları ilerlemeden tedavi etmek büyük önem arz etmektedir. Biz bu çalışmada servikal eksizyonel işlemlerde (konizasyon, LEEP) çıkarılan spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlığı, doğum haftası ,obstetrik komplikasyonlar ve gebelikteki maternal hastalıklar arasındaki ilişkiyi sorgulamayı istedik.

Çalışmamızda elde ettiğimiz verileri çıkarılan ektoservikal yüzey alanından bağımsız olarak değerlendirdiğimize; eksizyonel işlemden önce doğum yapmış hasta grubunda, önceki ve sonraki doğumlardaki annenin BMI'leri arasında anlamlı farklılık tespit edildi (p= 0,001). Biz ,eksizyonel işlemden sonraki doğumlarda artmış BMI'nin artan yaş ve artmış parite sayısı ile ilişkili olduğunu düşünmekteyiz. Çalışmamız da bu öngörüyü destekler nitelikte olup; eksizyonel işlemden önce doğum yapmış hasta grubunda ve sadece eksizyonel işlemden sonra doğum yapan hasta grubunda, çıkarılan ektoservikal yüzey alanının eksizyonel işlemden sonraki doğumlardaki annenin BMI'leri ile anlamlı ilişkisinin olmadığı (sırasıyla p=0,945, p=0,114) ve çıkarılan ektoservikal yüzey alanının doğumlardaki annenin BMI'leri ile korelasyon göstermediği görülmüştür (sırasıyla r=0 ,014, r= 0,224).

Althuisius ve arkadaşları yaptığı bir çalışmada LEEP işleminin doğumdaki gebelik haftasına etki edip etmediğini araştırmış, LEEP işlemi sonrası doğum haftaları arasında anlamlı bir fark bulamamıştır (6). Andia ve arkadaşlarının çalışmasında konizasyon sonrası gebelik grubunda (Grup A) ortalama doğum haftası 38,7, konizasyon öncesi gebelik grubunda (Grup B) ortalama doğum haftası 38,6 iken ,hiç konizasyon olmamış gebelik grubunda (Grup C) ise ortalama doğum haftası 39,2 bulunmuş. Andia ve arkadaşları 37 haftayı eşik değer olarak aldığında konizasyon sonrası doğum haftaları arasında anlamlı bir fark bulamamış (A ve B grupları arasında (p= 0,336) ve A ve C grupları arasında (p= 0,092) (7). Biz de bu çalışmaları destekler biçimde konizasyon ya da LEEP sonrası doğum haftaları arasında istatistiksel olarak anlamlı bir farklılık bulunamadık. Ancak eksizyonel işlem öncesinde doğum yapmış olan ilk hasta grubunda, spesmenin ektoservikal yüzey alanı ile doğum haftaları arasında orta derecede negatif korelasyon saptandık (r= -0,312) ancak aralarındaki ilişki anlamlı değidi (p= 0,113). Bu sonuçla çıkarılan ektoservikal yüzey alanının sonraki gebeliklerde doğum haftasına olan etkisinin,çıkarılan serviks hacmi ve endoservikal kanal derinliği ile yakın ilişkili olduğunu düşünmekteyiz.

Andia ve arkadaşları konizasyon sonrasında doğan bebeklerin doğum ağırlığını konizasyon olmamış bir grupla da karşılaştırmış, doğum ağırlığının konizasyon sonrasında gebelik geçirenlerde daha düşük olduğunu görmüştür (7). Jakobsson ve arkadaşları da CIN sonrası cerrahi herhangi bir yöntemle tedavi edilen 25827 hastayı ve sonraki 8210 tekil doğumu 1987-2004 yılları arasında incelemiş ve düşük doğum ağırlığı riski herhangi bir CIN tedavisinden sonra arttığını göstermiştir (8). Bizim çalışmamızda da önceki çalışmaları destekler nitelikte eksizyonel işlemden sonraki doğumlarda bebek doğum ağırlıklarında anlamlı azalma görüldü (p= 0,001). Ancak hastalarda spesmenin ektoservikal yüzey alanı ile bebek doğum ağırlıkları arasında bir korelasyon yoktu (r= -0,083) ve aralarında anlamlı ilişki de saptanmadı (p= 0,680). Sadece eksizyonel işlem sonrası doğum yapmış olan ikinci hasta grubunda, eksizyonel işlem spesmenin ektoservikal yüzey alanı ile doğumdaki bebek ağırlığı arasında orta düzeyde pozitif korelasyon vardı (r= 0,447), aynı zamanda aralarındaki ilişki de anlamlıydı (p= 0,025). Larsson ve arkadaşlarının yaptığı çalışmada term doğumlarda konizasyon sonrası servikal stenoz sıklığı anlamlı ölçüde artmış izlendi (p< 0.002). Yapmış oldukları çalışmada servikal stenoz, doğum eylemine rağmen genişlemeyen serviks, sezaryen ihtiyacı olan doğumlar olarak tanımlamış (3). Yüksek gradeli nullipar hastalarda küratif olabilen soğuk konizasyonunda amaç olabildiğince geniş doku çıkarmak ve negatif cerrahi sınırlara ulaşmak olduğundan bu hasta

grubunda servikal stenoz riski artmaktadır (9). Servikal stenozun doğum eyleminde geçikmeye neden olup, bebek doğum kilolarında artışa neden olabildiğini gösteren yeterli çalışma yoktur. Larsson ve arkadaşlarının yaptığı çalışmadan farklı olarak bizim çalışmamızda çıkarılan endoservikal kanal uzunluğunu değerlendirilmemiştir. Hasta popülasyonumuzun sınırlı sayıda kalması da çalışmamızın kısıtlayıcı tarafını oluşturmaktadır.

Larsson ve arkadaşları yaptıkları çalışmada nullipar kadınların konizasyon sonraki gebeliklerinde prematüre riskinde anlamlı bir artış olduğu görülmüştür (3). Bjeere ve arkadaşları hiç doğum yapmamış kadınların konizasyondan sonraki gebeliklerinin preterm doğum açısından büyük bir risk taşıdığını göstermiştir. Bunun da açıklamasını, genelde serviksi büyük ve geniş olan multipar kadınlara göre daha küçük olan nullipar serviksten daha fazla doku alınmış olması şeklinde yapmıştır (10).

Bu çalışmaların aksine Ganesh ve arkadaşları, LEEP sonrası gebe kalan kadınlar ile önceden eksizyonel işlem olmamış rutin gebelik takibi yapılan kadınların preterm doğum oranlarını karşılaştırmış. LEEP yapılan grup ile kontrol grubu arasında preterm doğum oranları açısından istatistiksel olarak anlamlı bir artış bulunmamış (11). Bizim çalışmamızda konizasyon ya da LEEP yapılan hastalarda sonraki gebeliklerde preterm doğum oranlarında istatistiksel olarak anlamlı bir farklılık bulunamadı. Paraskevaidis ve arkadaşları da LEEP yapılmış ve sonrasında doğum yapmış 28 hastayı çalışma grubuna almış. Kontrol grubuna ise benzer demografik özellikleri olan LEEP öyküsü olmayan ve doğum yapmış kadınları almış. Çalışma ve kontrol grubunun doğumdaki ortalama gebelik haftasını sırasıyla 37 hafta 6 gün ve 38 hafta 4 gün olarak bulmuş. Bu araştırmanın sonucu da bizimkine benzer şekilde iki grup arasında istatistiksel olarak anlamlı bir fark olmadığı sonucunu ortaya çıkarmıştır (12). Andia ve arkadaşlarının çalışmasında da konizasyon öncesi ve sonrası prematür doğum ve düşük doğum ağırlıklı bebek sayısında anlamlı farklılık izlenmemiştir (7). Crane ve arkadaşları eksize edilen servikal doku derinliğinin preterm doğum riski açısından önemli olduğunu vurgulamışlardır (13). Bizim çalışmamızda yukarıdaki çalışmalardan farklı olarak çıkarılan endoservikal kanal uzunluğunu değerlendirilmemiştir. Hasta popülasyonumuzun sınırlı sayıda kalması da çalışmamızın kısıtlayıcı tarafını oluşturmaktadır.

Daha önce yapılmış çalışmalarda konizasyonun servikal anatomik-fonksiyonel kayba neden olarak özellikle ikinci trimesterde servikal yetmezliğe bağlı düşüklere neden olabildiği gösterilmiş. Bizim çalışmamızda eksizyonel işlem öncesinde doğum yapmamış hastalarda spesmenin ektoservikal yüzey alanı ile servikal yetmezlik arasında orta derecede korelasyon saptandı (r= 0,319), ancak anlamlı ilişki saptanmadı. Çalışmamıza çıkarılan endoservikal kanal uzunluğu dahil edilmedi. Çalışmamızda nullipar hastalara eksizyonel işlemlerde LEEP tercihlerinde, fazladan çıkarılacak ektoservikal yüzey alanının da servikal yetmezliğe katkıda bulunabileceğini görüldü.

Konizasyon jinekolojik cerrahide komplikasyon oranı en yüksek olan cerrahi işlemlerdendir. Bu komplikasyonlar intraoperatif ve post-operatif kanama, infeksiyon, servikal stenoz, infertilite oranında artma, ve servikal yetmezlik olarak sıralanabilir (9). Daha önce yapılmış çalışmalarda eksizyonel işlem sonrasındaki gebeliklerde yenidoğan hastalıkları, obstetrik komplikasyonlar ve maternal hastalıklar açısından farklı sonuçlar elde edilmiştir. Bizim çalışmamızda hem eksizyonel işlem öncesi doğum yapmış hasta grubunda hem de doğum yapmamış hasta grubunda,eksizyonel işlem sonrası gebeliklerde yenidoğan hastalıkları, obstetrik komplikasyonlar ve maternal hastalıklar açısından anlamlı farklılık tespit edilmedi. Çıkarılan spesmenin yüzey alanı ile yenidoğan hastalıkları, obstetrik komplikasyonlar ve maternal hastalıklar arasında da korelasyon saptanmadı.

Çıkarılan spesmenin hacminin gebelik sonuçları üzerine bir çok çalışma mevcuttur. Kyrgiou ve arkadaşlarının yaptığı bir metaanalizde, tedavi olmayanlar ile karşılaştırıldığında koni derinliği artmış kadınlarda erken doğum riskinin daha yüksek olduğu gösterilmiş (14). Çıkarılan spesmendeki endoservikal uzunluğunun,total endoservikal kanal uzunluğuna oranının gebelik sonuçlarına olası etkilerini gösteren detaylı bir çalışma yoktur. Çalışmaların büyük çoğunluğu spesmen hacmi ve kalan endoservikal kanal uzunluğu üzerinedir. Biz çalışmamızda sadece spesmenin ektoservikal yüzey alanı ile obstetrik feto-maternal komplikasyonlar arasındaki ilişkiyi sorgulanmaya çalıştık.

Hasta sayımızın az olması ve geriye doğru taramada verilerin elde edilmesindeki yetersizlikler nedeni ile daha kapsamlı çalışmalar ile elde edilen sonuçların desteklenmesi gerektiğini düşünüyoruz.

SONUÇ

Yüksek gradeli servikal skuamöz intraepitelyal neoplaziler kriyoterapi ve lazer ablasyon gibi ablatif tedavilerle ya da soğuk konizasyon, lazer konizasyon ve Loop Elektrocerrahi Eksizyonel Prosedür (LEEP) gibi eksizyonel tedavi şekilleri ile yönetilebilmektedir. Bu işlemlerin sonraki gebeliklere olası etkilerini araştıran bir çok çalışma mevcuttur. Bu çalışmaların çoğunluğunda çıkarılan mayeryalin hacminin, çıkarılan endoservikal kanal derinliği/uzunluğunun işlem sonrası gebelik komplikasyonları ile ilişkisi gösterilmeye çalışılmış ve çıkarılan materyal hacmi ve endoservikal kanal derinliği ile orantılı olarak komplikasyonların artığı yönünde ortak bir fikir birliği oluşmuştur.

Biz yaptığımız çalışmada çıkarılan endoservikal kanal uzunluğundan bağımsız olmak üzere;çıkarılan materyalin ektoservikal yüzey alanının sonraki gebelikteki olası komplikasyonları ilişkisi sorgulanmaya çalışılmıştır. Çalışmamızda daha önceki yapılmış çalışmalardan farklı olarak sadece eksizyonel işlem sonrası doğum yapmış hastalarda, eksizyonel işlem spesmenin ektoservikal yüzey alanı ile term doğumdaki bebek ağırlığı arasında orta düzeyde pozitif korelasyon ve anlamlı ilişki saptandı. Her ne kadar eksizyonel işlem sonrasında gelişebilecek servikal stenozun term doğumlarda doğum eylemini geçiktirebileceği yönünde az sayıda çalışma olsa da bu durumun ortalama bebek doğum ağırlığında artışa yol açmasını destekleyen çalışmalar yoktur. Daha kapsamlı çalışmalara ihtiyaç vardır.

Çalışmamızda sadece spesmenin ektoservikal yüzey alanı ile diğer paremetrelerin değerlendirilmesi yapıldı. Çıkarılan toplam serviks hacmi ya da endoservikal kanal derinliği ihmal edildiğinde bile sadece çıkarılan spesmenin ektoservikal yüzey alanı ile orantılı olarak önemli anlamlılık taşımamasına rağemn,sonraki gebeliklerde bazı klinik değişebildiğini gördük. Hasta sayımızın az olması ve geriye doğru taramada verilerin elde edilmesindeki yetersizlikler çalışmamızı kısıtlı yönünüdür. Servikal eksizyonel işlemlerde gereksiz ektoservikal doku alanı çıkarılmasının sonrasındaki gebeliğe olan etkilerine yönelik daha kapsamlı çalışmalara ihtiyaç vardır.

KAYNAKLAR

1. Turligton WT, Wright BD, Powell JL. İmpact of loop electrosurgical excision procedure on future fertility. J. Reprod. Med. 41: 815-81. 1996
2. Kalliala I, Nieminen P, Dyba T, Pukkala E, Anttila A. Cancer free survival after CIN treatment: comparisons of treatment methods and histology. Gynecologic oncology. 2007;105(1):228-33.
3. Larsson, G., Grundsell, H., Gullberg, B., & Svennerud, S. (1982). Outcome of Pregnancy After Conization. Acta Obstetricia et Gynecologica Scandinavica, 61(5), 461–466. doi:10.3109/00016348209156591
4. Arbyn M, Kyrgiou M , Simoens C, Raifu AO, Koliopoulos G, Martin Hirsch P, Prendville W, Paraskevaidis E. Perinatal mortality and other severe adverse pregnancy outcomes associated with treatment of cervical, intraepithelial neoplasia: meta-analysis. BMJ 2008 Sep 18; 337: a1284.doi: 10.1136/bmj.a1284. Review.
5. Jonathan S.Berek. Berek & Novak Jinekoloji. 16th ed. Yıldırım Gökhan, Türk Verda Alpay, editors. Nobel Tıp Kitabevleri Tic.Ltd.Şti; 2021. 397–398 p.
6. Althuisius SM, Schornagel IJ, Dekker GA, at al. Loop electrosurgical excision procedure of the cervix and time of delivery in subsequent pregnancy. Int J Gnecol Obstet 72: 31-34. 2001
7. Andía, D., Mozo de Rosales, F., Villasante, A., Rivero, B., Díez, J., & Pérez, C. (2011). Pregnancy outcome in patients treated with cervical conization for cervical intraepithelial neoplasia. International Journal of Gynecology & Obstetrics, 112(3), 225–228. doi:10.1016/j.ijgo.2010.10.015 .
8. Jakobsson M, Gissler M, Sainio S, Paavonen J, Tapper AM. Preterm delivery after surgical treatment for cervical intraepithelial neoplasia. Obstet Gynecol 2007;109(2 Pt 1):309–13.
9. Ali Ayhan, Nicholas Reed, Murat Gültekin, Polat Dursun: Textbook of Gynaecological Oncology,Günefl Publishing, 2012.
10. Bjerre, B., Eliasson, G., Linell, F., SOderberg, H. & SjOberg, N.-0.: Conization as only treatment of carcinoma in situ of the uterine cervix. Am J Obstet Gynecol 125:143, 1976.
11. Ganesh Acharya, Ingvild Kjeldberg, Sidsel Mordt Hansen, at al. Arch Gynecol Obstet. 272; 109-12. 2005
12. Paraskevaidis E, Koliopoulos G, Lolis E, at al. Delivery outcomes following loop electrosurgical excision procedure for microinvasive(FIGO stage IA1) cervical cancer. Gynecol Oncol. 86: 10-13. 2002
13. Crane J. Pregnancy outcome after loop electrosurgical excision procedure: a systematic review. Obstet Gynecol Nov; 102: 1058-62. 2003
14. Maria Kyrgiou, Antonios Athanasiou,Maria Paraskevaidi, Anita Mitra, Ilkka Kalliala, Pierre Martin-Hirsch, Marc Arbyn, Phillip Bennett, Evangelos Paraskevaidis. Adverse obstetric outcomes after local treatment for cervical preinvasive and early invasive disease according to cone depth: systematic review and meta-analysis.BMJ,2016 Jul 28:354:i3633.doi: 10.1136/bmj.i3633.

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Comparison of ERAS interventions with routine protocols in gynecologic surgery

Jinekolojik Cerrahide ERAS uygulamalarının rutin protokollerle karşılaştırılması

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ABSTRACT

Aim: ERAS (Enhanced recovery after surgery) protocols are a set of rules that aim to improve the patient's well-being from admission to discharge, shorten the duration of hospitalization, and at the same time reduce costs. In this study, we aimed to evaluate whether ERAS protocols are superior to patient follow-up our hospital's protocol for gynecologic surgery patients.

Materials and Methods: The study included 50 patients who will undergo total abdominal hysterectomy and bilateral oophorectomy under general anesthesia. After the patients were divided into two groups, One group received the ERAS protocol while the other group received the routine protocol of our hospital. For both groups, patient's satisfactions and length of hospital stay were recorded.

Results: Patient's satisfaction during the entire hospitalization process (p=0.000), was significantly higher in the ERAS Group. The duration of hospitalization (p=0.02) were significantly shorter in ERAS Group.

Conclusions: In gynecological cases where the ERAS protocol was used, patient satisfaction and length of hospital stay were more favorable compared to the routine protocol of the hospital.

Keywords: ERAS, enhanced recovery after surgery, gynecologic surgery, patient's satisfaction

ÖZ

Amaç: ERAS (Cerrahi sonrası gelişmiş iyileşme) protokolleri, hastaneye yatıştan taburculuğa kadar hastanın refahını iyileştirmeyi, hastanede kalış süresini kısaltmayı ve aynı zamanda maliyetleri düşürmeyi amaçlayan bir dizi kuraldır.Bu çalışmada ERAS protokollerinin hastanemizin jinekolojik cerrahi hastaları için uyguladığı hasta takip protokolüne göre daha üstün olupolmadığını değerlendirmeyi amaçladık.

Gereç ve Yöntemler: Çalışmaya genel anestezi altında total abdominal histerektomi ve bilateral ooferektomi yapılacak 50 hasta dahil edildi. Hastalar iki gruba ayrıldıktan sonra bir gruba ERAS protokolü, diğer gruba ise hastanemizin rutin protokolü uygulandı. Her iki grup için de hasta memnuniyetleri ve hastanede kalış süreleri kaydedildi.

Bulgular: Tüm hastanede yatış süreci boyunca hasta memnuniyeti (p=0.000), ERAS Grubu'nda anlamlı olarak daha yüksekti. Hastanede kalış süresi (p=0.02) ERAS Grubu'nda anlamlı olarak daha kısaydı.

Sonuç: ERAS protokolünün kullanıldığı jinekolojik olgularda hasta memnuniyeti ve hastanede kalış süresi hastanenin rutin protokolüne göre daha olumluydu.

Anahtar Kelimeler: ERAS, cerrahi sonrası gelişmiş iyileşme, Jinekolojik cerrahi, hasta memnuniyeti

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INTRODUCTION

The enhanced recovery after surgery (ERAS) protocols standardize hospitalization through discharge. They are aimed to decrease metabolic stress and complications, facilitate a rapid return to everyday life, and decreasing the length of stay and costs (1,2).

A multidisciplinary team, including surgeons, anesthesiologists, nurses, physical therapists, and dietitians, is required for effective implementation of ERAS. Implementing a comprehensive approach to perioperative care helps prevent members of a large team from becoming separated and failing to implement the full protocol (3). Because even in hospitals where the ERAS protocol has been in place for some time, there is incomplete compliance with some of its elements (4,5).

Despite high compliance in the beginning, it declines over time, which consequently affects the treatment outcomes. That's why even with proper functioning, it is important to regularly monitor treatment outcomes and the quality of protocol implementation (6). Successful implementation of the ERAS protocol is possible only through the collaboration of a team of surgeons, anesthesiologists and nurses (7).

Follow-up and monitoring of discharged patients is recommended for the detection and evaluation of clinical outcomes and continuity of care (8). Safe patient discharge is essential, including the availability of rapid access to care. To promote healthcare integrity, one study provided discharged patients with a rapid access phone number (9).

Despite the strong evidence supporting ERAS, implementation in daily practice tends to be slow, requiring a step-by-step transition to acclimate the environment to the procedure. The support of the persons in charge and the adoption of a comprehensive set of guidelines by the scientific societies are also very important (10).

ERAS protocols were first introduced in the field of colorectal surgery, and then a variety of protocols have been developed for different types of surgery (10,11). The ERAS Gynecologic/Oncology guidelines were first published in 2016 by Nelson et al. and updated in 2019 (12,13, 14).

ERAS Protocols

Nurses' acceptance of the use of this protocol and the cooperation of anesthesiologists and physicians are essential for the success of ERAS(15).(In overcoming barriers to ERAS implementation and ensuring protocol adherence, nurses play a key role (16).

Firstly, staff should be trained to discuss any issues that may arise during the introduction phase (9).

Patients should be informed both verbally and in writing when they are admitted. This education will help the patient to control postoperative pain and prevent nausea and anxiety. It is recommended that the patient receives counselling throughout the process (12,17,18).

It has been stated that by eliminating the lack of knowledge of the patients, tolerance to pain increases and perioperative narcotic and non-narcotic analgesics requirement decreases (19,20).

Preoperative administration of oral carbohydrates is associated with maintaining preoperative health and reducing postoperative insulin resistance (21). Patients can consume a light snack up until 6 hours and clear fluids up until 2 hours before the anesthesia (9,22).

It has been reported that taking 400 ml of oral carbohydrates up to 2-3 hours before anesthesia and 800 ml of carbohydrates the night before surgery provides a decrease in postoperative insulin resistance, preservation of muscle strength and body weight, increase in cardiac activity, decrease in myocardial damage, decrease in hyperglycemia and decrease in the dose of insulin administration (23).This application is one of the most important things to be done to reduce metabolic stress in the surgical process.

Similarly, early onset of oral intake is an important goal of the protocol. Early feeding plays an important role in earlier recovery of intestinal function, shorter hospital length of stay and increased patient outcome. Nausea and vomiting assessment will facilitate early feeding by ensuring the patient's postoperative comfort(24,25).

Short-acting anesthetics and postoperative non-opoidal analgesic aid optimal pain control and functional recovery and to minimize nausea, sedation, fatigue, and risk of opioid addiction (26).

Postoperative nausea and vomiting should be prevented as it may limit a patient's ability to begin oral feeding in the early recovery phase (9).

It is important to recognize the importance of early nutrition in the first 24 hours after surgery (27,28).

In postoperative pain management, the combined use of non-opioid drugs is preferred to reduce the side effects of opioid use (13).

Minimally invasive surgery is an important consideration for rapid postoperative recovery as it is effective in avoiding prolonged NG catheter use, maintaining normothermia and normovolemia, preventing postoperative ileus and early mobilization (12). The ERAS protocol requires removal of the urinary catheter within 24 hours (13). In addition, ambulation is recommended as much as the patient can tolerate between 8-24 hours postoperatively(29).

In this study, we planned to evaluate the effectiveness of our hospital's routine practices and ERAS protocols in terms of patient satisfaction and length of stay in patients undergoing total abdominal hysterectomy and/or bilateral oophorectomy under general anesthesia in our clinic.

METHODS

The study protocol was approved by Ankara Bilkent City Hospital Ethical Committee (E2-23-3124) in 04/01/23.

Before the patients were included in the study, the leaders of the relevant disciplines came together in a multidisciplinary meeting. An ERAS protocol was prepared that we could apply in our clinic.

The study included 50 ASA (American Society of Anesthesiologists)1 and ASA2 female patients between the ages of 18-65 years who will undergo total abdominal hysterectomy and bilateral oophorectomy under general anesthesia. Written and verbal consent is obtained from the patients.

The 50 subjects included in the study were randomly divided into two groups by drawing lots from envelopes containing 25 envelopes labeled "Group ERAS(E)" and 25 envelopes labeled "Group Routine(R)" when they were admitted to the hospital.

Patient refusal, the necessity to perform an intervention that is not in accordance with ERAS protocols, and the change of routine practices on a patient basis due to the occurrence of complications in the surgical process were the criteria for withdrawal. Also patients with type 1 or type 2 diabetes mellitus were not included in the study.

In the patient group in which the routine protocol was applied (Group R), the usual follow-up of the ward was performed.(Table 1) In both groups, the psychological status of the patient's were evaluated. Although patients are not normally questioned about anxiety, it was asked in both groups, not only Group E, in order to obtain study data.

In the patient group in which ERAS protocol was applied (Group E), exercise, pain, mobilization training was given by nurses after hospitalisation and their consent was obtained. Patients showered with chlorhexidine-based antimicrobial soap the night before surgery. They were allowed to drink water until 3 hours before surgery. Preoperative nutritional support was provided 3 hours before surgery (400ml carbohydrate-rich liquid food). Bowel preparation was not done for also two groups.

Upon entering the operating room, the patient's information was double-checked and the patient was asked to verbally confirm the location of surgery.

Risk factors for postoperative nausea and vomiting (non-smoking-postoperative nausea/ vomiting history- opioid administration) were evaluated and if the risk was 3 or higher, 4 mg. dexamethasone was administered at induction and 8 mg. Ondansetron was administered. Patient warming device was used during the case. No nasogastric catheter and drain was inserted. No opioids were used for postoperative analgesia (Paracetamol and nonsteroidal anti-inflammatory drugs were used). Attempts were made to switch to a normal diet within 24 hours postoperatively and the patient was strongly advised to consume caffeine and chew gum.

Out-of-bed mobilization for 2 hours on operation day and out-of-bed mobilization for 6 hours on post-operative 1^{2} day were targeted

Patient education was given before discharge.They were instructed to call or come to the hospital quickly in case of any problems

For both groups; Time of urinary catheter removal, the time for passage of gas by intestines, postoperative 2nd hour visual analogue scale (VAS), length of hospitalization, patient's satisfaction with the whole process, patient's satisfaction with the operating room process, patient's satisfaction with the ward process (all satisfaction ratings will be rated on a scale of 1-10) were recorded.

SPSS (Statistical Package for Social Science) 21 package program was used for data analysis. Descriptive statistics were expressed as mean ± standard deviation for continuous variables and number of observations and (%) for nominal variables. After determining normal distrubution using Kolmogorov-Smirnov test for quantitative data, analysis were performed using Student's t-test or Mann–Whitney U-test. $\chi 2$ test was used for qualitative data. $P<0.05$ was considered significant.

RESULTS

Fifty patients were included in our study. Demographic data and anxiety levels of the patients are given in Table 2. The average age was 56 ± 8.3 in group E and 58 ± 6.8 in group R. (p=0.822)

Table 1. Group E and Group R protocols

Group E protocol	Group R protocol
Evaluation of the psychological status of the patient	Evaluation of the psychological status of the patient
Preoperative exercise, pain, mobilization training	
Consent	Consent
Shower with chlorhexidine-based antimicrobial soap the night before surgery	Shower with chlorhexidine-based antimicrobial soap the night before surgery
Snack consumption until 12 a.m. at night	
No bowel preperation	No bowel preperation
Antithrombotic prophylaxis at 7 p.m. (at the night before surgery)	Antithrombotic prophylaxis at 7 p.m. (at the night before surgery)
Preoperative 400 cc. carbohydrate supplementation (at 3 hours before surgery)	
Drinking water up to 3 hours before surgery	
Antibiotik prophylaxis within 1 hour of incision	Antibiotik prophylaxis within 1 hour of incision
Double-checking patient information in the operating room	Double-checking patient information in the operating room
Verbal confirmation of the patient's surgical site	Verbal confirmation of the patient's surgical site
Nausea and vomiting evaluation and treatment	Only ondansetron
Patient warming	
Avoiding Liquid Overloading	Avoiding Liquid Overloading
No nasogastric catheter and drain	
No opioids were used for postoperativeanalgesia	
Early mobilization(3rd hour)	Mobilization at 6th hour
Early feeding (3rd hour)	Feeding at 6th hour
Frequent reminders about caffeine consumption and chewing gum	
Urinary catheter removal earlier (3rd hour)	Urinary catheter removal at 6th hour
Patient education given before discharge	Advices given before discharge

Group E : Group ERASGroup R : Group Routine

Table 2. Demographic data and anxiety the patient groups

	Group E	Group R	p
ASA1(%)	11 (44%)	8 (32%)	0.561
ASA2(%)	14 (56%)	17 (68%)	0.561
Anxiety	22 (88%)	23 (92%)	0.036

Group E : Group ERASGroup R : Group Routine

The groups were comparable with respect to age, ASA, operative time and intraoperative fluid (Table 2 and 3). Although group R was significantly higher in anxiety (P=0.036), there was only one patient difference between the two groups.

The ERAS protocol was successfully implemented in all Group E patients. None of the patients in the Group E experienced any complications or problems that required protocol disruption

Table 3. Patient follow-up values

	Group E Mean ±SD	Group R Ortalama ±SD	p
Duration of surgery, min	85±15	97±26	0.247
Intraoperative fluid, ml	900±124	1000±149	0.165
Time of urinary catheter removal,hr	4.2±0.6	6±0	0.00
Postoperative VAS	7.3±0.6	4.7±1.4	0.00
Time for passage of gas by intestines (hour)	13.6±4.2	20.9±4.5	0.002
Length of hospitalization(day)	1.2±0.4	1.8±0.4	0.02

Group E : Group ERASGroup R : Group Routine

Table 4. Patient's satisfaction scores with operating-room, ward process and the whole process

	Group E Mean ±SD	Group R Ortalama ±SD	p
Patient's satisfaction score during the entire hospitalization process	9.8±0.3	9,2±0,7	0.000
Patient's satisfaction score during the operating- room process	9.8±0.3	9.2±0.6	0.001
Patient's satisfaction score during the ward process	9.7±0.4	9.2±0.7	0.012

Group E : Group ERASGroup R : Group Routine

In the Group R, the removal time of the urinary catheter was 6 hours postoperatively, while in the group E, it was aimed to be removed at 4 hours postoperatively. Urinary catheter removal time was significantly shorter in Group E (p=0.00). Postoperative VAS scores were significantly higher in Group E (p=0.00).

The time for gas to pass through the intestines (p=0.002) and the duration of hospitalization (p=0.02) (Table 3) were significantly shorter in Group E.

Patient's satisfaction during the entire hospitalization process (p=0.000), patient's satisfaction during the operating- room process (p=0.001) and patient's satisfaction during the ward process (p=0.012) were significantly higher in the Group E (Table 4).

DISCUSSION

In our study, we compared whether the ERAS protocol is superior to the routine patient follow-up protocol in terms of patient outcome and patient satisfaction.

Although the days of hospitalization were statistically shorter in the ERAS group, when considered clinically, they had very similar values. We believe that this is related to our clinic's policy of discharging patients as quickly and safely as possible.

Scores of Group Ewere higher than scores of Group Rin terms of patient satisfaction with the ward, operation room and the whole process. Since our hospital is a reference hospital and has some accreditations, it has its own criteria, similar to ERAS rules, which are meticulously applied. Therefore, although Group R patients also had high satisfaction, the successful implementation of the ERAS protocol led to higher results.

Since our routine fluid therapy protocols were similar to ERAS protocols, the intraoperative infused fluid was similar between the groups. Euvolemia was aimed by avoiding fluid overload or hypovolemia (24).

In Group E patients, the urinary catheter removal time was aimed to be changed from the sixth hour to the fourth hour postoperatively and was successfully performed. Shorter catheterization time resulted in decreased infection rates in many studies (30). Relatively early removal of the urinary catheter in the Group E did not cause any problems or recatheterization.

However, since the lack of opioid use in postoperative analgesia causes an increase in pain, it may be appropriate to add gabapentin to the initial treatment.

The time for gas to pass through the intestines was faster in Group E than in Group R. This was thought to be related to early feeding and early mobilization after the surgery.In one study, patients were permitted to consume clear liquids within 30 minutes and solid food within 1 hour of surgery. As a result, a shorter hospital stay was observed (31).

We believe that the main challenge in implementing ERAS criteria is not the rules, but the healthcare workers who may resist the implementation of these rules. ERAS practices may face resistance from healthcare personnel due to their perceived safety and familiarity with older treatment methods that management has approved for years. Consequently, ERAS protocols may take time to become widely adopted (32,9).

The limited team of ERAS-trained nurses and doctors on the ward and in the operating room limits the possibility of widespread implementation and adds extra workload. For the staff, who often work in insufficient numbers and with a heavy workload, additional applications may create unhappiness.

However, it is seemed to be certain that ERAS protocols, when implemented correctly, have positive aspects for both the patient and the healthcare system. The way to achieve widespread adoption is for hospital administrators, team leaders, and unit managers to receive multidisciplinary ERAS training and establish a system where only ERAS rules apply (33).

In this way, when the ERAS protocol becomes a routine practice, rather than a method partially applied to some patients, all staff will

be familiar with the protocol and practitioners will not feel anxious and uncomfortable.

We believe that starting with the ERAS protocols that are most easily adapted to the system, rather than implementing them quickly and with all their rules, will both increase staff compliance and remove hesitation when positive results are achieved. Increased compliance will bring other benefits, both in terms of patient outcomes and financially (34,35,36).

It was thought that evaluating and analyzing patient results after regular applications would increase success (14,33).

CONCLUSIONS

We found that in gynecology cases in which we applied the ERAS protocol, patients' satisfaction and length of hospital stay were more favorable compared to the routine protocol of our hospital. The rapid spread of ERAS practices requires a positive view of the ERAS protocol by those in managerial positions, multidisciplinary training of all relevant personnel, and follow-up to see positive results.

Authors' contributions

Nihan Aydın Güzey participated in writing the article and designing the project. Esra Uyar Türkyılmazparticipated in article revision and project design. Nihan Aydın Güzey, Namık Özcan and Elif Kurtparticipated in the data collection. Şefik Mustafa Aksoy and Ayşe Filiz Yavuz participated design of the Project and in article revision.

All authors read and approved the final manuscript.

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Competing interests

The authors declare that there is no conflict of interest.

Availability of data and materials

The datasets used or analysed during the current study are available from the corresponding author on reasonable request.

REFERENCES

1. Agarwal P, Frid I, Singer J, Zalatimo O, Schirmer CM, Kimmell KT, et al. Neurosurgery perception of enhanced recovery after surgery (ERAS) protocols. J Clin Neurosci.2021; 92:110-114.
2. Greco M., Capretti, G. Beretta L., Gemma M., Pecorelli N., Braga M. Enhanced recovery program in colorectal surgery: a meta-analysis of randomized controlled trials, World J. Surg. 2013; 38 :1531-1541, http://dx.doi.org/10.1007/s00268-013-2416-8.
3. Polle S.W., Wind J., Fuhring J.W., Hofland J., Gouma D.J., Bemelman W.A. Implementation of a fast-track perioperative care program: what are the difficulties? Dig. Surg.2007;24:441-449, http://dx.doi.org/10.1159/000108327.
4. Walter C.J., Smith A., Guillou P. Perceptions of the application of fast-track surgical principles by general surgeons, Ann. R. Coll. Surg. Engl.2006; 88: 191-195, http://dx.doi.org/10.1308/003588406X94940.
5. Ahmed J., Khan S., Gatt M., Kallam R., MacFie J. Compliance with enhanced recovery programmes in elective colorectal surgery, Br. J. Surg. 2010;97: 754-758, http://dx.doi.org/10.1002/bjs.6961.
6. Cakir H., van Stijn M.F.M., Lopes Cardozo A.M.F., Langenhorst B.L.A.M., Schreurs W.H., van der Ploeg T.J., et al. Adherence to enhanced recovery after surgery and length of stay after colonic resection, Colorectal Dis. 2013;15: 1019-1025, http://dx.doi.org/10.1111/codi.12200.
7. Bozkırlı BO, Gündogdu RH, Ersoy PE, Akbaba S, Temel H, Sayın T. ERAS protokolü kolorektal cerrahi sonuçlarımızı etkiledi mi? Turkish Journal of Surgery. 2012;28(3):149-52. https://doi.org/10.5152/UCD.2012.05.
8. Steenhagen E. Enhanced recovery after surgery: It's time to change practice! Nutr Clin Pract. 2016;31:18- 29
9. Pędziwiatr M, Kisialeuski M, Wierdak M, Stanek M, Natkaniec M, Matłok M, et al. Early implementation of Enhanced Recovery After Surgery (ERAS®) protocol-compliance improves outcomes: a prospective cohort study. Int J Surg.2015;21:75-81. http://www.sciencedirect.com/science/article/pii/S1743919115010559.
10. Kehlet H., Wilmore D.W. Evidence-based surgical care and the evolution of fast-track surgery, Ann. Surg. 2008; 248(2): 189-198, http://dx.doi.org/10.1097/ SLA.0b013e31817f2c1a.
11. Kehlet, H., Wilmore, D. W. Multimodal strategies to improve surgical outcome. American Journal of Surgery.2002;183(6): 630-641
12. Nelson G, Altman AD, Nick A, Meyer L.A., Ramirez P. T., Achtari C., et al. Guidelines for pre- and intra-operative care in gynecologic/oncology surgery: Enhanced Recovery After Surgery (ERAS®) society recommendations--Part I. Gynecol Oncol . 2016; 140:313–22.
13. Nelson G., Altman AD., Nick A., Meyer L.A., Ramirez P. T., Achtari C., et al. Guidelines for postoperative care in gynecologic/oncology surgery: Enhanced Recovery After Surgery (ERAS®) society recommendations--part II. Gynecol Oncol .2016;140:323–32.
14. Nelson G, Bakkum-Gamez J, Kalogera E, Glaser G., Altman A., Meyer L.A.,et al. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations 2019 update. Inc J Gynecol Cancer. 2019; 29:651-68.
15. Hübner M, Addor V, Slieker J, Griesser AC, Lécureux E, Blanc C, et al. The impact of an enhanced recovery pathway on nursing workload: a retrospective cohort study. Int J Surg. 2015;24(Pt A):45-50.
16. Brown D, Xhaja A. Nursing perspectives on enhanced recovery after surgery. Surg Clin North Am. 2018;98(6):1211-21, https://doi.org/10.37689/acta-ape/2021AR02105.
17. Bluman LG, Mosca L, Newman N, Simon DG: Preoperative smoking habits and postoperative pulmonary complications. Chest.1998; 113:883-889.
18. Hounsome J, Lee A, Greenhalgh J, Lewis SR, SchofieldRobinson OJ, Coldwell CH, et al. A systematic review of information format and timing before scheduled adult surgery for peri-operative anxiety. Anaesthesia.2017; 72:1265-1272.
19. Gan TJ, Habib AS, Miller TE, White W, Apfelbaum JL: Incidence, patient satisfaction, and perceptions of postsurgical pain: Results from a US national survey. Curr Med Res Opin.2014; 30:149-160.
20. Wilson CJ, Mitchelson AJ, Tzeng TH, El-Othmani MM, Saleh J, Vasdev S, et al. Caring for the surgically anxious patient: A review of the interventions and a guide to optimizing surgical outcomes. Am J Surg 2016; 212:151-159.
21. Nygren J, Thorell A, Ljungqvist O. Preoperative oral carbohydrate therapy. Curr Opin Anaesthesiol 2015; 28:364–9.
22. Brady M, Kinn S, Stuart P. Preoperative fasting for adults to prevent perioperative complications. Cochrane Database Syst Rev. 2003;4:CD004423.
23. Nygren J: The metabolic effects of fasting and surgery. Best Pract Res Clin Anaesthesiol.2006; 20:429-438.
24. Altman A. D., Robert M., Armbrust R., Fawcett W. J., Nihira M., Jones C. N., et al. Guidelines for vulvar and vaginal surgery: Enhanced Recovery After Surgery Society recommendations. American journal of obstetrics and gynaecology. 2020; 223:475–485, https://doi.org/10.1016/j.ajog.2020.07.039.

25. Fernandez-Guisasola J., Gómez-Arnau J. I., Cabrera Y., Del Valle S. G. Association between nitrous oxide and the incidence of postoperative nausea and vomiting in adults: a systematic review and meta-analysis: review article. Anaesthesia. 2010; 65(4):379-87, 10.1111/j.1365-2044.2010.06249.x.

26. Dolin SJ, Cashman JN. Tolerability of acute postoperative pain management: nausea, vomiting, sedation, pruritus, and urinary retention. evidence from published data. British Journal of Anaesthesia 2005; 95: 584–91.

27. NICE Clinical Guideline 132. Published date: 23 November 2011 Last updated: 04 September 2019. https://www.nice.org.uk/guidance/cg132.

28. Zonca P, Stigler J, Maly T, Neoral C, Hajek M, Stiglerova S. Do we really apply fast-track surgery? Bratisl Lek Listy. 2008;109:61-5.

29. Bollag L, Tiouririne M, Lim G, Carvalho B, Zakowski M, Bhambhani S et al. Society of Obstetric Anesthesia and Perinatorlogy (SOAP) Enghanced Recover After Cesarean (ERAC) Consensus Statement. May 23, 2019. Available at: https://soap.org//SOAPEnhanced-Recovery-After-Cesarean-ConsensusStatement.pdf. Accessed Agust 5, 2020

30. Phipps S, Lim YN, McClinton S, Barry C, Rane A, N'Dow J. Short term urinary catheter policies following urogenital surgery in adults. Cochrane Database Syst Rev 2006;2: CD004374.

31. Wrench IJ, Allison A, Galimberti A, Radly S, Wilson MJ. Introduction of enhanced recovery for elective caesarean section enabling next day discharge: a tertiary center experience. Int J Obstet Anesth. 2015;24: 124-130.

32. Herbert G, Sutton E, Burden S, Lewis S, Thomas S, Ness A, et al. Healthcare professionals' views of the enhanced recovery after surgery programme: a qualitative investigation. BMC Health Serv Res. 2017;17(1):617.

33. Ament SM, Gilliseen F, Moser A, Maessen JM, Dirksen CD, von Meyenfeldt MF, et al. Factors associated with sustainability of 2 quality improvement programs after achieving early implementation success. A qualitative case study. J Eval Clin Pract. 2017;23(6):1135-43, https://doi.org/10.1111/jep.12735.

34. Gustafsson UO, Hausel J, Thorell A, Ljungqvist O, Soop M, Nygren J et al. Adherence to the enhanced recovery after surgery protocol and outcomes after colorectal cancer surgery. Arch Surg 2011; 146: 571–577, http://dx.doi.org/10.1001/archsurg.2010.309.

35. Feroci F, Lenzi E., Baraghini M, Garzi A., Vannucchi A, Cantafio S, et al. Fasttrack colorectal surgery: protocol adherence influences postoperative outcomes. Int. J. Colorectal Dis. 2012:28;103-109, http://dx.doi.org/10.1007/s00384-012-1569-5.

36. Alcantara-Moral M, Serra-Aracil X, Gil-Egea M.J, Frasson M, Flor-Lorente B, Garcia-Granero E, et al. Observational cross-sectional study of compliance with the fast track protocol in elective surgery for colon cancer in Spain, Int. J. Colorectal Dis. 2014:29; 477-483, http://dx.doi.org/10.1007/s00384-013-1825-3.

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Role of fetal cardiac assessment in predicting adverse perinatal outcomes in preterm dichorionic twins

Preterm dikoryonik ikizlerde olumsuz perinatal sonuçları öngörmede fetal kardiyak değerlendirmenin rolü

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ABSTRACT

Aim: To investigate the role of the fetal modified myocardial performance index (Mod-MPI) and fetal cardiac output index measurement in predicting adverse perinatal outcomes amongpreterm dichorionic twins.

Materials and Method: This prospective cohort study was conducted at the X Clinic andincluded 34 dichorionic twinfetuses bornearly preterm and 40 dichorionic twinfetusesborn late preterm.The early preterm group was divided into two according to whether they were admitted to theneonatal intensive care unit (NICU). The groups' cardiac function and Mod-MPI measurements were compared regardingtheir predictive ability for adverse perinatal outcomes.

Results: The Mod-MPI values were similar between theearly and late pretermgroups (p=0.144). The leftventricular cardiac output Z-score was lower in the preterm group (p=0.014). The Mod-MPI and left ventricular outflow tract-isovolumetric contraction and isovolumetric relaxation times were significantly higher among the newborns admitted to the NICU in the early preterm group (p=0.002, p=0.003, and p=0.001, respectively).

Conclusion: Our study suggests that the Mod-MPI measurement can be used to predict adverse perinatal outcomes in dichorionic twin fetusesbornin the early preterm period.

Keywords: Adverse perinatal outcomes, cardiac function, dichorionic twin, myocardial performance index, preterm birth

ÖZ

Amaç: Preterm dikoryonik ikizlerde fetal modifiye miyokardiyal performans indeksi (Mod-MPI) ve fetal kardiyak output indeksi ölçümünün olumsuz perinatal sonuçları öngörmedeki rolünü araştırmak.

Gereç ve Yöntemler: Bu prospektif kohort çalışması X Kliniğinde yürütüldü ve erken preterm doğan 34 dikoryonik ikiz fetüs ile geç preterm doğan 40 dikoryonik ikiz fetüs dahil edildi. Erken preterm grubu yenidoğan yoğun bakım ünitesine (YYBÜ) kabul edilip edilmemelerine göre ikiye ayrılmıştır. Grupların kötü perinatal sonuçları öngörmede kardiak fonksiyonları ve Mod-MPI ölçümleri karşılaştırıldı.

Bulgular: Mod-MPI değerleri erken ve geç preterm grupları arasında benzerdi (p=0.144). Sol ventrikül kalp debisi Z-skoru preterm grupta daha düşüktü (p=0,014). Mod-MPI ve sol ventrikül çıkış yolu-izovolümetrik kasılma ve izovolümetrik gevşeme süreleri erken preterm grubunda YYBÜ'ye kabul edilen yenidoğanlar arasında anlamlı olarak daha yüksekti (sırasıyla p=0.002, p=0.003 ve p=0.001).

Sonuç: Çalışmamız Mod-MPI ölçümünün erken preterm dönemde doğan dikoryonik ikiz fetüslerde olumsuz perinatal sonuçları öngörmek için kullanılabileceğini göstermektedir.

Anahtar Kelimeler: Olumsuz perinatal sonuçlar, kardiyak fonksiyon, dikoryonik ikiz, miyokardiyal performans indeksi, erken doğum

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INTRODUCTION

In the last three decades, the global incidence of twin pregnancies has increased by 70% due to the use of assisted reproductive technologies (1). Among the obstetric conditions known to increase the risk of perinatal mortality, twin pregnancies constitute an important and well-known factor (2). The rate of perinatal mortality may be higher in twin pregnancies compared to singleton pregnancies, which is mostly associated with the higher rates of preterm births observed in the former. Preterm birth and birth weight are also important determinants of morbidity and mortality in infancy (3). Approximately half of all twins are born before 37 weeks of gestation or with a birth weight of <2,500 g (4). In addition, twin pregnancies have been observed to increase neonatal morbidity and mortality, including a six-fold increase in preterm births before 34 weeks of gestation (5).

Parameters evaluated during a fetal cardiac ultrasound examination are closely associated with perinatal mortality (6). The modified myocardial performance index (Mod-MPI) measured by Doppler ultrasonography can assess overall heart function since it includes the systolic and diastolic components of the cardiac cycle (7). Another parameter used to evaluate cardiac function is cardiac output (CO), which can directly represent ventricular systolic function. A normal fetus has a high reserve potential to sustain CO. When compensatory mechanisms are exhausted, CO decreases with decreased myocardial performance, resulting in poor tissue perfusion, progressive acidosis, and ultimately fetal mortality (8).

In this study, we aimed to examine the relationship of the Mod-MPI and CO values with perinatal morbidity and mortality in twin fetusesborn preterm. We specifically focused on dichorionic twins, considering that this type of pregnancy accounts for the majority of twin pregnancies and requires a different antenatal management plan than monochorionic twins (9).

MATERIALS AND METHODS

This prospective cohort study was conducted between January 2022 and January 2023 at the X Clinic. The study was designed following the principles of the Declaration of Helsinki. After the participants were given detailed information about the study, their written consent was obtained. The study was approved by the Number 2 Ethics Committee of the hospital (Number: E2-21-680).

The primary endpoint of the study was cardiac function in dichorionic diamniotic twin fetusesborn preterm. The secondary endpoint was the ability of fetal cardiac function to predictthe requirement for neonatal intensive care unit (NICU) admission in premature dichorionic diamniotic twin fetusesborn preterm.

Study population

The sample consisted of 34 dichorionic twinfetusesbornearly preterm and 40 dichorionic diamniotic twinfetusesborn late preterm. The early preterm group was accepted as those born before 34 weeks of gestation, and the late preterm group as those born between 34 0/7 and 36 6/7 weeks of gestation.The cases constituting the sample were selected from pregnant women at 24-34 weeks of gestation.According to the examination, the cases included in the study did not havea short cervix (<25 mm), vaginal dilatation, uterine contraction, or premature rupture of membranes (PPROM). Dichorionic diamniotic pregnancies where labor occurredafter37 weeks of gestation were also not included in the sample. At least one dose of antenatal corticosteroid was administered to all cases in which delivery occurredbefore 34 weeks of gestation, while tocolytics were administered for 48 hours to thosein which labor started spontaneously. Excluded from the studywere pregnant women withsystemic diseases, such as chronic kidney, liver, lung, and heart diseases, diabetes mellitus, history of malignancy, Rh incompatibility, and comorbidities such as placenta previa.Other exclusion criteria weremonochorionic pregnancies, the use of an invasive diagnostic test during pregnancy, the intrauterine death of one of the twins, and structural or chromosomal fetal anomalies.

The demographic characteristics, fetal biometry, fetal birth weight, gestational week at which ultrasonography was performed, delivery week, first- and fifth-minute Apgar scores, fetal cardiac ultrasonographic parameters, and NICU requirement were noted and compared between the groups.

According to the indication of delivery, the cases were classified as spontaneous preterm, PPROM, or induced delivery. Spontaneous delivery was defined as regular uterine contractions accompanied by cervical dilatation and progressive changes in effacement. Induced delivery was defined as the induction of labor or cesarean delivery due to an unstable fetal condition. Assisted reproductive technology pregnancies referred tothe use of anytreatment method (in vitro fertilization or intracytoplasmic sperm injection) that involved the removal of eggs from the ovaries and combining them with sperm by applying a surgical procedure to achieve pregnancy.

Ultrasonography

The sonographic examinations of all participants were performed by a single obstetrician (X) with more than five years of experience, under the supervision of a professor of maternal-fetal medicine (X). To prevent intra-observer and inter-observer errors, at least three measurements were taken by the same sonographer (X), and the mean values of these measurements were used in statistics. Sonographic evaluations were performed using the Voluson E8 ultrasound device (GE Healthcare, Milwaukee, WI) with a 2.3-8.4 MHz convex transducer (C2-9-D) transabdominal probe. Fetal ultrasonography included biometry, fetoplacental Doppler, and fetal cardiac parameters. The fetal cardiac morphology of all fetuses included in the study was normal. The percentile values for estimated fetal weight were calculated as described by Hadlock et al. (10).

Dichorionic diamniotic twin pregnancies were defined based on the different sexes of the fetuses, two separate placental locations, or the thickness of the membrane where the amniotic membrane entered the placenta creating a "lambda sign" (11). Cases in which chorionicity could not be clearly distinguished were excluded from the study. The measurements of the aortic valve diameter and the pulmonary valve diameter were obtained from the images of the right ventricular outflow tract (RVOT) and the left ventricular outflow tract (LVOT). Using the same images, the flow rates of the left ventricular CO (LVCO) and the right ventricular CO (RVCO) were measured immediately distal to the valves by keeping the insonation angle close to 0 °and adjusting the Doppler cursor to 2-3 mm. The combined CO was obtained as the sum of LVCO and RVCO (12). The Z-scores of the cardiac outflow tracts were calculated according to the study by Mao et al.(13). The Mod-MPI measurement was performed in the left ventricle from the lateral wall of the aorta, including both the aortic and mitral valves, using the Doppler cursor in the apical four-chamber view.The Mod-MPI value was calculated by dividing isovolumetric contraction time (ICT) and isovolumetric relaxation time (IRT) by ejection time (14). The aortic and pulmonary artery valve Z-scores were determined according to the week of gestation. All cardiac measurements were obtained during fetal silence conditionat a fetal heart rate of 120-160 beats/min.

Statistical analysis

SPSS version 22 (IBM, Chicago, IL, USA) was used for statistical analyses. The Kolmogorov-Smirnov test was conducted to determine whether the data fit the normal distribution. Upon determining that the data did not havea normal distribution, the Mann-Whitney U test was used for the comparison of the two groups. The chi-square test was used when examining categorical variables. Data were presented as median (interquartile range) or number (percentage). $P<0.05$ was considered statistically significant.

RESULTS

A total of 74 dichorionic diamniotic twin fetusesborn preterm were included in the study. The sample was divided into two groups: early preterm (n = 34) and late preterm (n = 40). The demographic characteristics and perinatal outcomes of all participants are presented in Table 1. Age, body mass index (BMI), gestational week at ultrasonography, estimated fetal weight, fifth-minute Apgar score, placental localization, gravidity, parity, and number ofspontaneous abortions were similar between the early and late preterm groups. However, the groups significantly differed in terms of delivery week, delivery indications, birth weight, first-minute Apgar scores, and requirement of NICU admission ($p<0.001$, $p=0.007$, $p<0.001$, $p=0.014$, and $p= 0.003$, respectively).

The comparison of the cardiac functions of the early and late preterm groups is shown in Table 2. Accordingly, the aortic velocity time integral (VTI) and aortic peak systolic velocity (PSV) values were found to be statistically significantly lower among the early pretermdichorionic twins ($p<0.001$ and $p=0.002$, respectively). The LVCO and LVCO Z-scores were also statistically significantly lower in the early preterm group ($p=0.0029$ and $p=0.014$, respectively). The remaining CO parameters and Mod-MPI were similar between the early and late preterm groups.

Table 3 presents the data related to the cardiac function of the dichorionic diamniotic twins in the preterm group according to their status of admission to the NICU. Of the early preterm group, 20 were admitted to the NICU and had significantly higher Mod-MPI, LVOT-ICT, and LVOT-IRT values ($p = 0.002$, $p = 0.003$, and $p = 0.001$, respectively) compared to those who did not require NICU admission (n = 14). In addition, the neonates admitted to the NICU had a statistically significantly lower aortic annulusvalue and Z-score ($p = 0.001$ and $p = 0.039$, respectively). When the pulmonary artery parameters were examined, the pulmonary artery annulus and Z-score were statistically significantly lower in the NICU-admitted group ($p=0.006$ and $p=0.041$, respectively). Lastly, the fetal heart rate was significantly higher in the group requiring NICU admission ($p=0.013$).

Table 1. Comparison of demographic data and perinatal outcomes of dichorionic twin fetuses between the early and late preterm groups.

	Early preterm (n = 34)	Late preterm (n = 40)	P value
Maternal age (years)	30 (8.3)	29.5 (12.5)	0.931
Maternal BMI (kg/m^2)	29.8 (3.8)	28.8 (6.3)	0.543
Gravidity	2 (2)	2 (2)	0.820
Parity	1 (1)	0.5(1.8)	0.523
Abortion	0 (1)	0 (1)	0.871
Conception method, n (%) ART Spontaneous	 14 (41.2%) 20 (58.8%)	 22 (55%) 18 (45%)	0.236
Gestational week[a]	30 (5.3)	30.5 (4.5)	0.469
Delivery week	33 (3)	36 (1.8)	<0.001
Delivery mode, n (%) Cesarean section Vaginal delivery	 32 (94.1%) 2 (5.9%)	 40 (100%) 0	0.120
Complications, n (%) GH GD	 2 (5.9%) 4 (11.8%)	 6 (15%) 4 (10)	0.451
Estimated fetal weight (grams)	1,471 (657.5)	1,625 (781.3)	0.224
Birth weight (grams)	1,805 (757.5)	2,445 (441.3)	<0.001
First-minute Apgar score<7, n (%)	10 (29.4%)	3 (7.5%)	0.014
Fifth-minute Apgar score<7, n (%)	3 (8.8%)	0	0.055
NICU admission, n (%)	20 (58.8%)	10 (25%)	0.003
Placental localization, n (%) Anterior Posterior	 21 (61.8%) 13 (38.2%)	 17 (42.5%) 23 (57.5%)	0.098

(BMI: body mass index, ART: assisted reproductive technology, PPROM: preterm prelabor rupture of membranes, GH: gestational hypertension, GD: gestational diabetes, NICU: neonatal intensive care unit)
Data are expressed as median (interquartile range) or number (percentage). Statistically significant at $p < 0.05$.
[a]Gestational age at which ultrasonogprahy was performed.

Table 2. Comparison of the cardiac functions of the dichorionic twin fetusesbetween the early and late preterm groups.

	Early preterm (n = 34)	Late preterm (n = 40)	P value
Fetal heart rate	150 (13.3)	143 (13.5)	0.078
Aortic VTI (cm)	0.068 (0.027)	0.084 (0.021)	<0.001
Aortic annulus (mm)	4.7 (1.2)	4.9 (0.9)	0.724
Aortic annulus (Z-score)	0.1 (1.2)	0 (1.3)	0.914
Aortic PSV	55.5 (14.3)	63 (9.8)	0.002
PA-VTI (cm)	0.083 (0.027)	0.082 (0.024)	0.944
PA annulus (mm)	5.8 (1.3)	6.1 (1.2)	0.210
PA annulus (Z-score)	0 (1.9)	-0.1 (0.7)	0.308
PAPSV	55 (13.5)	55.5 (18)	0.832
LVCO (ml/ms)	193.2 (83.1)	216.8 (114.3)	0.029
LVCO(Z-score)	-1.3 (1.0)	-0.4 (1.4)	0.014
RVCO (ml/ms)	315.1 (225.1)	351.7 (281.4)	0.179
RVCO(Z-score)	-0.9 (1.7)	-0.8 (1.8)	0.248
CCO (ml/ms)	497.7 (220.5)	582.5 (381.9)	0.099
CCO(Z-score)	-0.9 (1.0)	-0.6 (0.7)	0.063
LVOT-ICT	36.5 (10.3)	37 (10)	0.974
LVOT-IRT	48 (13.3)	47 (10)	0.527
LVOT-ET	152 (30.5)	160 (20)	0.093
Mod-MPI	0.58 (0.15)	0.53 (0.11)	0.144
Mod-MPI (Z-score)	0.8 (1.2)	0.4 (0.9)	0.144
MCA-PSV	31 (11.8)	31.5 (12.5)	0.348
MCA-PI	1.6 (0.4)	1.6 (0.4)	0.618
UA-PI	0.9 (0.3)	1 (0.2)	0.637

(VTI: velocity time integral, LVCO: left ventricular cardiac output, RVCO: right ventricular cardiac output, CCO: combined cardiac output, LVOT: left ventricular outflow tract, ICT: isovolumetric contraction time, IRT: isovolumetric relaxation time, ET: ejection time, Mod-MPI: modified myocardial performance index, MCA: middle cerebral artery, PSV: peak systolic velocity, PI: pulsatility index
Data are expressed as median (interquartile range). Statistically significant at $p < 0.05$.

Table 3. Comparison of the cardiac functions of the early preterm dichorionic twin fetusesaccording to their NICU admission status.

	Admitted to NICU (n = 20)	Not admitted to NICU (n = 14)	P value
Fetal heart rate	153 (7.5)	142 (14.5)	**0.013**
Aortic VTI (cm)	0.072 (0.03)	0.068 (0.02)	0.806
Aortic annulus (mm)	4.5 (1.0)	5.3 (0.6)	**0.001**
Aortic annulus (Z-score)	-0.3 (1.4)	0.4 (1.1)	**0.039**
Aortic PSV	56 (14.5)	53 (14.3)	0.713
PA-VTI (cm)	0.081 (0.03)	0.086 (0.02)	0.327
PA annulus (mm)	5.5 (1.7)	6.5 (1.1)	**0.006**
PA annulus (Z-score)	-0.3 (1.8)	0.5 (1.9)	**0.041**
PAPSV	55 (19)	54.5 (14)	0.563
LVCO (ml/ms)	154.2 (112)	197.9 (60.4)	0.124
LVCO (Z-score)	-1.4 (1.9)	-1.2 (0.8)	0.687
RVCO (ml/ms)	260.2 (185.6)	351.6 (134.4)	**0.025**
RVCO (Z-score)	-1.1 (1.6)	-0.6 (1.4)	0.156
CCO (ml/ms)	447.8 (265.5)	574.7 (179.9)	**0.025**
CCO (Z-score)	-1.1 (1.4)	-0.7 (0.6)	0.335
LVOT-ICT	45 (12.5)	36 (9.8)	**0.003**
LVOT-IRT	55 (11.5)	45.5 (7)	**0.001**
LVOT-ET	149 (30.8)	154.5 (28.8)	0.726
Mod-MPI	0.64 (0.2)	0.51 (0.1)	**0.002**
Mod-MPI (Z-score)	1.2 (1.3)	0.2 (1.1)	**0.002**

(NICU: neonatal intensive care unit, VTI: velocity time integral, PSV: peak systolic velocity, LVCO: left ventricular cardiac output, RVCO: right ventricular cardiac output, CCO: combined cardiac output, LVOT: left ventricular outflow tract, ICT: isovolumetric contraction time, IRT: isovolumetric relaxation time, ET: ejection time, Mod-MPI: modified myocardial performance index
Data are expressed as median (interquartile range). Statistically significant at $p < 0.05$.

DISCUSSION

This prospective study showed that the aortic VTI, aortic PSV, and LVCO values were lower in the dichorionic twins born early preterm compared to those born late preterm.In addition, higher Mod-MPI, pulmonary artery, and aortic annulus values were observed amongthe dichorionic diamniotic twin fetuseswho requiredadmission to the NICUin the early preterm group. Our study provides evidence showing the importance of cardiac functions in dichorionic twin fetusesborn preterm. To the best of our knowledge, this is the first study to examine CO and Mod-MPI in preterm dichorionic twin fetuses.

Twin pregnancies have higher rates of obstetric complications, preterm delivery, and perinatal morbidity and mortality compared to singleton pregnancies(15). Prematurity is one of the most important causes of high perinatal mortality in twin pregnancies (16).Studies have shown that the rates of preterm birth in twin pregnancies range from 31% to 63% (17, 18).In addition to spontaneous prematurity among the causes of preterm birth, nearly half of preterm twin births have been reported to be medically induced (19). However, there are not yet clear markers to predict the occurrence of preterm birth and perinatal morbidity and mortality in twin pregnancies. In a previous study, it was determined that amniotic membrane thickness could be used to determine adverse perinatal outcomes in dichorionic twins (20). In the current study, the Mod-MPI value was found to be higheramongthe dichorionic twins who were admitted to the NICU in the early preterm group. This finding suggests that the Mod-MPI value may be significant in predicting NICU after an early preterm delivery.

The fetal Mod-MPI is a non-invasive measure of myocardial function derived from pulsed-wave Doppler ultrasonography (21). It has become a reliable marker of fetal cardiac dysfunction. Among the components of Mod-MPI, ICT is affected by systolic changes, while IRT is affected by diastolic changes (22). Some studies have shown that fetal MPI is affected by conditions such as diabetic and post-term pregnancies, PPROM, intrauterine fetal growth retardation, and twin-twin transfusion syndrome (23-26). Zhang et al. determined that Mod-MPI could be used to predict adverse perinatal outcomes in fetuses with intrauterine growth retardation (27). In a study consisting of pregnant women with placenta previa

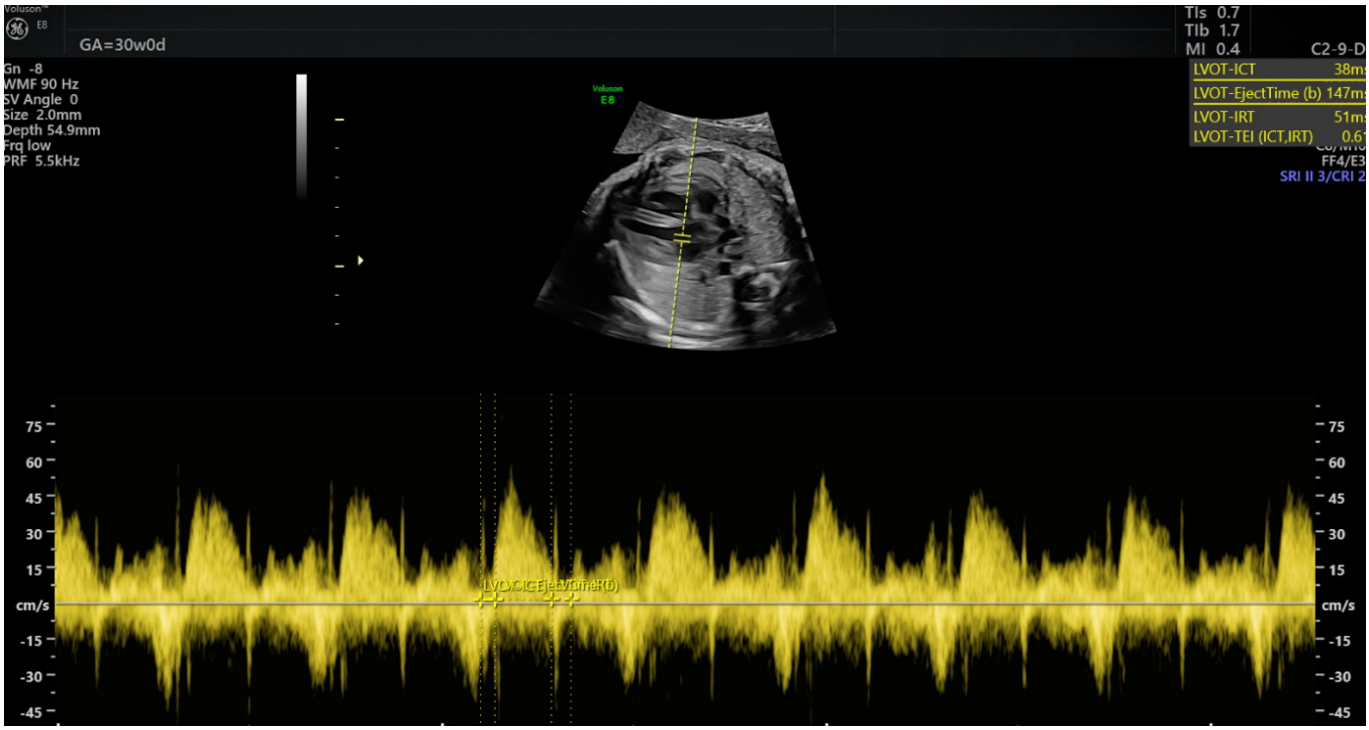

Figure 1. Measurement modified myocardial performance index (Mod-MPI).

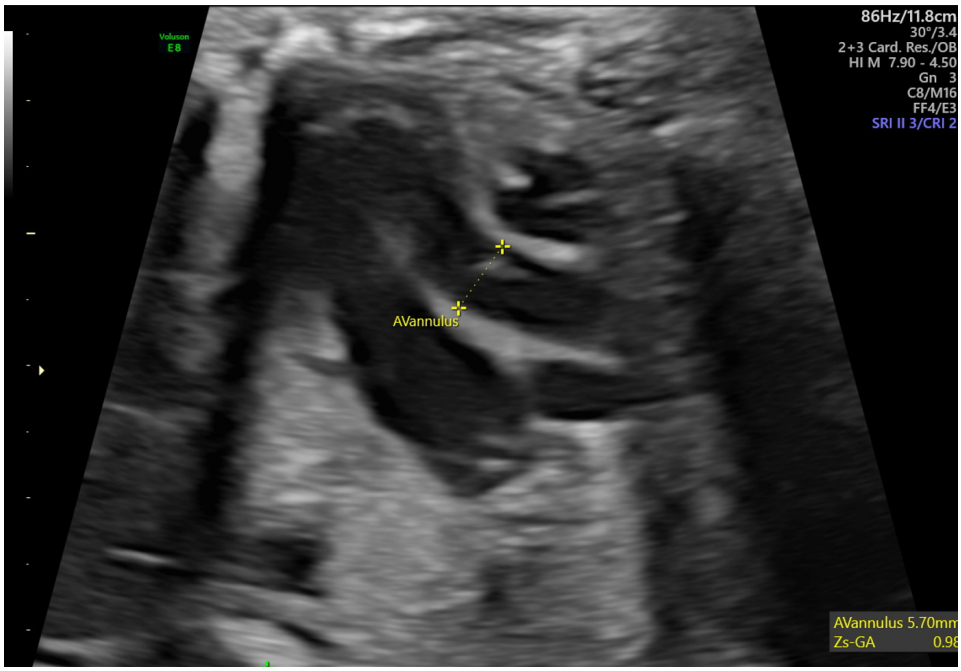

Figure 2. Aortic valve annulus diameter.

and healthy controls without fetal anomalies, the fetal Mod-MPI value was found to be an independent risk factor in demonstrating adverse fetal outcomes in patients with placenta previa (28). In the current study, we observed similar Mod-MPI values between the early and late preterm groups of dichorionic twins. However, we also determined that the Mod-MPI, LVOT-ICT, and LVOT-IRT values were higher among those requiring NICU admission in the early preterm group. The concomitant increase in IRT and ICT may also be an early sign of loss of both systolic and diastolic functions in these patients. Therefore, our study shows the importance of a close follow-up in fetuses with high Mod-MPI values.

CO is obtained by multiplying the stroke volume by the heart rate and depends on three main factors: preload, afterload, and myocardial contractility (29). A functioning heart consistently maintains an appropriate CO and adapts to changing circulatory demands.In fetal

life, both ventricles usually work in parallel, and CO measurements are usually obtained by performing the calculationofeach ventricle separately (30). The distribution of CO in the fetus is likely to be affected by fetoplacental growth and development (31).In some cases, studies have shown that fetal CO is increased. Increased CO has been observed in certain types of fetal arteriovenous shunts, such as fetal anemia, hypoxia, intrauterine fetal growth retardation, fetal teratoma, or placental chorioangioma (32-34). A decrease in CO, defined as a Z-score of less than 2, indicates decreased ventricular filling or contractility, which is responsible for most cases of fetal heart failure, including structural cardiac defects (35). In our study, in which we examined dichorionic twins born preterm, combined CO was found to be similar between the early and preterm groups, while LVCO was lower in the early preterm group. We did not observe any difference in CO according to the NICU admission status in the early preterm group.

Fetal aortic stenosis can lead to increased left ventricular afterload, resulting in the loss of systolic and diastolic functions (8). Fetuses with aortic stenosis are associated with worse diastolic dysfunction, larger left ventricle, more extensive endocardial fibroelastosis, and lower left ventricular pressure (36). Pulmonary stenosis can occur as part of complex congenital heart disease or as an isolated finding, causing unfavorable remodeling of the right ventricle and increased filling pressure (37).The fetal pulmonary artery annulus measurement has been observed to be similar in terms of perinatal outcomes in patients with PPROM (38). In the current study, the aortic annulus and pulmonary artery annulus measurements were lower among the infants admitted to the NICUin the early preterm group.The results of our studyare intriguing in terms of the relationship between the arterial measurementsof fetuses without cardiac anomalies and morbidity in twins.

Fetal cardiac ultrasonography is a non-invasive evaluation that provides valuable information on fetal hemodynamics and cardiovascular adaptation according to intrauterine environment conditions. In recent years, with the increase in the quality of ultrasonography devices and the experience of specialists, the widespread use of fetal cardiac ultrasonography has allowed clinicians to obtainusefulinformation in terms of fetal well-being. Our preliminary data suggest that fetal CO and Mod-MPI may play a role in predicting perinatal outcomes in dichorionic twin pregnancies.

Limitations

This study has certain limitations. First, it was conducted in a singlecenter with a relatively lownumber of patients, which may have resulted inan insufficient analysis. Further comprehensive and multicenter studies are needed to overcome thislimitation. Second, we did not include long-term neonatal outcomes. Despite these limitations, thestrength of our study was that it was undertaken in a tertiary centerwith high-quality equipment and experience infetal ultrasonography.

CONCLUSION

To the best of our knowledge, this is the first study to perform a fetal cardiac ultrasonographic evaluation in dichorionic twin fetusesborn preterm. Our study provides evidence showing the value of Mod-MPI measurement in predicting adverse perinatal outcomes in early preterm dichorionic twin fetuses. The accurate prediction and early detection of complications should be prioritized in the management of twin pregnancies since they offer the opportunity for timely intervention and improved outcomes. However, the mechanisms underlying these changes have not yet been clarified; therefore, there is a need for well-designed, large-population studies to provide a better understanding ofthe role of cardiac function in demonstrating fetal well-being.

REFERENCES

1. Young BC, Wylie BJ. Effects of twin gestation on maternal morbidity. Semin Perinatol. 2012;36(3):162-8.
2. Vogel JP, Torloni MR, Seuc A, Betrán AP, Widmer M, Souza JP, et al. Maternal and perinatal outcomes of twin pregnancy in 23 low- and middle-income countries. PLoS One. 2013;8(8):e70549.
3. Rizwan N, Abbasi RM, Mughal R. Maternal morbidity and perinatal outcome with twin pregnancy. J Ayub Med Coll Abbottabad. 2010;22(2):105-7.
4. Fill Malfertheiner S, Weigl M, Dudakova A, Seelbach-Göbel B. Birth management and fetal outcome in multiple gestation: analysis of 1.444 births. Arch Gynecol Obstet. 2018;297(1):61-9.
5. Martin JA, Hamilton BE, Ventura SJ, Osterman MJ, Kirmeyer S, Mathews TJ, et al. Births: final data for 2009. Natl Vital Stat Rep. 2011;60(1):1-70.
6. Crispi F, Valenzuela-Alcaraz B, Cruz-Lemini M, Gratacós E. Ultrasound assessment of fetal cardiac function. Australas J Ultrasound Med. 2013;16(4):158-67.
7. Peixoto AB, Bravo-Valenzuela NJ, Rocha LA, Araujo Júnior E. Spectral Doppler, tissue Doppler, and speckle-tracking echocardiography for the evaluation of fetal cardiac function: an update. Radiol Bras. 2021;54(2):99-106.
8. Srisupundit K, Luewan S, Tongsong T. Prenatal Diagnosis of Fetal Heart Failure. Diagnostics (Basel). 2023;13(4).
9. Practice Bulletin No. 169: Multifetal Gestations: Twin, Triplet, and Higher-Order Multifetal Pregnancies. Obstet Gynecol. 2016;128(4):e131-46.
10. Hadlock FP, Harrist RB, Sharman RS, Deter RL, Park SK. Estimation of fetal weight with the use of head, body, and femur measurements--a prospective study. Am J Obstet Gynecol. 1985;151(3):333-7.
11. von Kaisenberg C, Klaritsch P, Ochsenbein-Kölble N, Hodel ME, Nothacker M, Hecher K. Screening, Management and Delivery in Twin Pregnancy. Ultraschall Med. 2021;42(4):367-78.
12. Alsolai AA, Bligh LN, Greer RM, Kumar S. Relationship of prelabor fetal cardiac function with intrapartum fetal compromise and neonatal status at term. Ultrasound Obstet Gynecol. 2018;51(6):799-805.

13. Mao YK, Zhao BW, Zhou L, Wang B, Chen R, Wang SS. Z-score reference ranges for pulsed-wave Doppler indices of the cardiac outflow tracts in normal fetuses. Int J Cardiovasc Imaging. 2019;35(5):811-25.
14. Hernandez-Andrade E, López-Tenorio J, Figueroa-Diesel H, Sanin-Blair J, Carreras E, Cabero L, et al. A modified myocardial performance (Tei) index based on the use of valve clicks improves reproducibility of fetal left cardiac function assessment. Ultrasound Obstet Gynecol. 2005;26(3):227-32.
15. Deltombe-Bodart S, Deruelle P, Drumez E, Cordiez S, Catteau-Jonard S, Garabedian C. Obstetrical and perinatal complications of twin pregnancies: is there a link with the type of infertility treatment? Acta Obstet Gynecol Scand. 2017;96(7):844-51.
16. Rissanen AS, Gissler M, Nupponen IK, Nuutila ME, Jernman RM. Perinatal outcome of dichorionic and monochorionic-diamniotic Finnish twins: a historical cohort study. Acta Obstet Gynecol Scand. 2022;101(1):153-62.
17. Qazi G. Obstetric and perinatal outcome of multiple pregnancy. J Coll Physicians Surg Pak. 2011;21(3):142-5.
18. Assunção RA, Liao AW, Brizot Mde L, Krebs VL, Zugaib M. Perinatal outcome of twin pregnancies delivered in a teaching hospital. Rev Assoc Med Bras (1992). 2010;56(4):447-51.
19. Refuerzo JS. Impact of multiple births on late and moderate prematurity. Semin Fetal Neonatal Med. 2012;17(3):143-5.
20. Bracero LA, Byrne DW. Ultrasound determination of chorionicity and perinatal outcome in twin pregnancies using dividing membrane thickness. Gynecol Obstet Invest. 2003;55(1):50-7.
21. Maheshwari P, Henry A, Welsh AW. The Fetal Modified Myocardial Performance Index: Is Automation the Future? Biomed Res Int. 2015;2015:215910.
22. Cui W, Roberson DA, Chen Z, Madronero LF, Cuneo BF. Systolic and diastolic time intervals measured from Doppler tissue imaging: normal values and Z-score tables, and effects of age, heart rate, and body surface area. J Am Soc Echocardiogr. 2008;21(4):361-70.
23. Ichizuka K, Matsuoka R, Hasegawa J, Shirato N, Jimbo M, Otsuki K, et al. The Tei index for evaluation of fetal myocardial performance in sick fetuses. Early Hum Dev. 2005;81(3):273-9.
24. Sakcak B, Farisoğulları N, Denizli R, Menekse Beser D, Tanacan A, Goncu Ayhan S, et al. Evaluation of the fetal myocardial performance ındex and Epicardial fat thickness in pregnant women with preterm prelabor rupture of membranes. J Matern Fetal Neonatal Med. 2023;36(1):2192322.
25. Ozel A, Alici Davutoglu E, Yildirim S, Madazli R. Fetal cerebral and cardiac hemodynamics in postdate pregnancy. J Matern Fetal Neonatal Med. 2019;32(20):3458-63.
26. Ma Y, Li C, Wang Y, Zhang H. Prenatal Prediction of Fetal Growth Restriction and Postnatal Outcomes by Ultrasound Assessment of Fetal Myocardial Performance Index and Blood Flow Spectrum. Evid Based Complement Alternat Med. 2022;2022:4234137.
27. Zhang L, Han J, Zhang N, Li Z, Wang J, Xuan Y, et al. Assessment of fetal modified myocardial performance index in early-onset and late-onset fetal growth restriction. Echocardiography. 2019;36(6):1159-64.
28. Zhang N, Sun L, Zhang L, Li Z, Han J, Wu Q. Assessment of Fetal Myocardial Performance Index in Women with Placenta Previa. Med Sci Monit. 2017;23:5933-42.
29. Godfrey ME, Messing B, Cohen SM, Valsky DV, Yagel S. Functional assessment of the fetal heart: a review. Ultrasound Obstet Gynecol. 2012;39(2):131-44.
30. Tutschek B, Schmidt KG. Techniques for assessing cardiac output and fetal cardiac function. Semin Fetal Neonatal Med. 2011;16(1):13-21.
31. Vimpeli T, Huhtala H, Wilsgaard T, Acharya G. Fetal cardiac output and its distribution to the placenta at 11-20 weeks of gestation. Ultrasound Obstet Gynecol. 2009;33(3):265-71.
32. Copel JA, Reed KL. Doppler ultrasound in obstetrics and gynecology: Springer; 1995.
33. Rizzo G, Arduini D. Fetal cardiac function in intrauterine growth retardation. Am J Obstet Gynecol. 1991;165(4 Pt 1):876-82.
34. Horigome H, Hamada H, Sohda S, Igari M, Nagata M, Okuno S, et al. Large placental chorioangiomas as a cause of cardiac failure in two fetuses. Fetal Diagn Ther. 1997;12(4):241-3.
35. Sukegawa S, Yamamoto Y, Sato K, Tanaka S, Tanaka T, Mitsuhashi N. Ultrasound evaluation of fetal critical aortic stenosis using the left atrium area/cardiac area ratio and the Doppler patterns in the pulmonary veins. J Med Ultrason (2001). 2019;46(2):267-72.
36. Friedman KG, Schidlow D, Freud L, Escobar-Diaz M, Tworetzky W. Left ventricular diastolic function and characteristics in fetal aortic stenosis. Am J Cardiol. 2014;114(1):122-7.
37. Pang C, Wang Y, Shen J, Yang L, Li Y, Pan W. Echocardiographic characteristics and clinical outcomes in fetuses with pulmonary stenosis or pulmonary atresia with intact ventricular septum. Pediatr Neonatol. 2023.
38. Yamamoto Y, Hirose A, Jain V, Hornberger LK. Branch pulmonary artery Doppler parameters predict early survival-non-survival in premature rupture of membranes. J Perinatol. 2020;40(12):1821-7.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Fetal abdomen çapı ölçümü ile omuz distosisi arasındaki ilişkinin incelenmesi-retrospektif vaka kontrol çalışması

Investigation of the relation ship between fetal abdominal diameter measurement and shoulder dystocia-retrospective case control study

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ÖZ

Amaç: Çalışmamızda fetal abdomen çevresi ölçümü ile omuz distosisi arasında herhangi bir ilişki olup olmadığı araştırılmıştır.

Gereç ve Yöntemler: Çalışmamız retrospektif bir çalışmadır. Hastanemizde 2013-2023 yılları arasında doğum yapmış hastalar çalışmaya alınmıştır. Vajinal doğum yapmış 100 vaka ve 100 kontrol grubu olmak üzere toplam 200 hasta çalışmaya alınmıştır. Fetal abdomen çevresi ile omuz distosisi arasındaki ilişki irdelenmiştir. Çalışmamızın istatistik analizi için SPSS (IBM SPSS for Windows, Ver.26) istatistik paket programı kullanılmıştır.

Bulgular: Hastaların yaş ortalaması 28.1±5.6'dir. Gebelerin fetal abdomen çevresi ultrason ölçüm değeri ortalaması 36.3+1.3 cm'dir. Omuz distosisi görülen grupta ultrasonda fetal abdomen çevresi ölçümü 37.27±0.5 cm ve üzeri saptanmıştır. Omuz distosisi saptanan grupta fetal abdomen çevresi ölçümü kontrol grubuna kıyasla istatiksel olarak anlamlı yüksek saptanmıştır (p=0.000). Çalışmamızda fetal ağırlık ile omuz distosisi arasında istatiksel olarak anlamlı bir ilişki saptanmamıştır (p=0.235). Omuz distosisi görülen gebelerde fetal komplikasyon görülme oranları istatiksel olarak anlamlı yüksek bulunmuştur (p=0.000). Omuz distosisi görülen gebelerde maternal komplikasyon görülme oranları istatiksel olarak anlamlı yüksek bulunmuştur (p=0.001). Ek parametrelere bakıldığı zaman yüksek parite, yüksek vücut kitle indeksi ve diabetik hasta grubunda omuz distosisi istatiksel olarak yüksek saptanmıştır.

Sonuç: Çalışmamızda omuz distosisi görülen grupta fetal abdomen çevresi ölçümü ortalaması 37.27±0.5 cm olarak saptanmıştır ve kontrol grubuna göre istatistiksel olarak anlamlı şekilde yüksek izlenmiştir.

Anahtar Kelimeler: Omuz distosisi, obstetrik komplikasyon, klumpke paralizisi, erb-dushene paralizisi

ABSTRACT

Aim: In our study, we investigated whether there is any relationship between fetal abdominal circumference measurement and shoulder dystocia.

Materials and Methods: Our study is retrospective. Patients who gave birth in our hospital between 2013 and 2023 were included in the study. A total of 200 patients, 100 cases, and 100 control groups who had a vaginal delivery were included in the study. The relationship between fetal abdominal circumference and shoulder dystocia was examined. SPSS (IBM SPSS for Windows, Ver.26) statistical package program was used for statistical analysis of our study.

Results: The average age of the patients is 28.1±5.6. The average ultrasound measurement value of the fetal abdomen circumference of pregnant women is 36.3+1.3 cm. In the group with shoulder dystocia, the ultrasound measurement of fetal abdominal circumference was found to be 37.27±0.5 cm and above. Fetal abdominal circumference measurement was found to be statistically significantly higher in the group with shoulder dystocia compared to the control group (p=0.000). In our study, no statistically significant relationship was found between fetal weight and shoulder dystocia (p=0.235). Fetal complication rates were found to be statistically significantly higher in pregnant women with shoulder dystocia (p=0.000). The rates of maternal complications in pregnant women with shoulder dystocia were found to be statistically significantly higher (p=0.001). When additional parameters were examined, shoulder dystocia was statistically higher in the high parity, high body mass index, and diabetic patient groups.

Conclusion: In our study, the average fetal abdomen circumference measurement in the group with shoulder dystocia was found to be 37.27±0.5 cm and was statistically significantly higher than the control group.

Keywords: Shoulder dystocia, obstetric complication, klumpke's paralysis, erb-dushene paralysis

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GİRİŞ

Omuz distosisi fetus başının doğumundan sonra, omuz veya omuzların çıkmasındaki başarısızlık sonucu oluşur. Takılmış omuz ön veya arka omuz olabilir, ancak her iki omuz da takılabilir. Omuz distosisi fetus omuz boyutu ile pelvis girişi arasında uyumsuzluk olduğunda ortaya çıkar (1). Fetus ve anne pelvisi arasında artan direnç veya hızlı bir doğumda turunkal dönme hatası nedeniyle omuzlar ön-arka pozisyonda kalır. Her ne kadar fetal başın çıkımı sonrası geri çekilmesi olarak tarif edilen "kaplumbağa işareti" omuz distosisi habercisi olabilse de, son ana kadar omuz distosisi tanısı konamayabilir. Literatür omuz distosisinin tahmin edilemeyeceğini ve herhangi bir özel strateji ve manevra ile önlenemeyeceğini göstermektedir (1).

Bu potansiyel komplikasyon tüm vajinal doğumların %0.2-3'ünde görülür (2). Bu geniş aralık literatürde omuz distosisi için standart bir tanımın olmamasına bağlanmaktadır. Başın çıkımı ve omuzların doğumu arasında geçen zaman 60 saniye olarak kabul edildiğinde omuz distosisi insidansı %10 iken, operatör tarafından %25-45 oranında yanlış tanı konmaktadır (3). Omuz distosisinin fetal ağırlığa göre 2500-4000 gr arasındaki insidansı %0.6-1.4 oranında iken, 4000-4500 gram ağırlıkta insidansı %5-9'a çıkar (4).

Diyabet omuz distosisi için riski arttırır ve aslında diğer faktörlerin öngördüğü riskleri çoğaltabilir (5). Annedeki diyabet omuz distosisi için bildirilmiş en tutarlı risk faktörüdür. Risk diyabetik anne bebeklerinde ağırlık kategorilerine karşın iki katına çıkar. Diyabetik kadınlarda omuz distosisi riski 4000-4250, 4250-4500, 4500-4750 ve 4750-5000 gr ağırlığındaki bebeklerde sırasıyla %12.2, %16.7, %27.3 ve %34.8 olarak bildirilmiştir (6). Annede diyabet makrozomi artışı ile yakından ilişkili olduğu gibi diyabetik anne bebekleri ile diyabetik olmayan anne bebekleri karşılaştırıldığında büyüme paternlerinde değişiklikler vardır. Omuz distosisinin antropomorfik tahminini değerlendiren Cohen; diyabetik gebeliklerde baş çevresi ve karın çevresi ultrasonografi ölçümleri arasında 2.5 cm'yi aşan bir fark saptanması halinde, omuz distosisini %100 oranında tahmin edilebildiğini bildirmiştir (7). AC fetal ağırlığı değerlendirmek için kullanılan temel fetal biyometrik parametrelerden biridir. Biparietal çap (BPD), baş çevresi (HC) ve femur uzunluğu (FL) ile birlikte AC tahmini fetal ağırlık hesaplamasında kullanılan önemli bir parametredir. Jazayeri karın çevresinin doğum ağırlığı için en iyi lineer belirleyici olduğunu ve 35 cm veya daha fazla bir karın çevresinin makrozomik bebeklerin % 93'ünü tahmin edebildiğini bildirmiştir (8). Bizim çalışmamızda ise fetal abdomen çevresi ölçümleri ile omuz distosisi arasındaki ilişki araştırılmıştır. Böylece omuz distosisi erken öngörüsü mümkün olabilecek ve riskli hastaları saptama imkanı doğacaktır.

GEREÇ VE YÖNTEMLER

Araştırmanın Yeri ve Zamanı

Araştırmamız 2023 yılında Uşak Eğitim ve Araştırma Hastanesi'nde yapılmıştır. Çalışmamız retrospektif vaka kontrol çalışmasıdır.

Araştırma Evren ve Örneklemi

Araştırmanın evrenini 01.01.2013-01.01.2023 yılları arasında Uşak Eğitim ve Araştırma hastanesinde vajinal doğum yapmış hastalar oluşturmaktadır. Hastanemizde 24513 tekil doğumda belgelenmiş omuz distosisi olan 100 vaka çalışma grubu olarak alınmıştır. Çalışmamız 100 vaka ve 100 kontrol grubu olmak üzere 200 hasta üzerinden kurgulanmıştır. Çalışmaya vajinal doğum yapan hastalar alınmıştır.

Çalışma Tasarımı

Çalışmaya alınacak hastalar yaş, mevcut vajinal doğum anındaki gestasyonel haftası, toplam gebelik sayısı, toplam canlı doğum sayısı, vücut kitle indeksi (VKİ), ek hastalık, önceki vajinal doğum esnasında komplikasyon varlığı, mevcut doğumda omuz distosisi varlığı, ultrasonda fetal abdomen çevresi ölçümü (AC) ayrıca omuz distosisi olan gebelerde maternal ve fetal komplikasyon varlığı yönünden irdelenmiştir. Hastalar omuz distosisi olan ve olmayan grup olarak iki grup olarak alınmıştır. Her iki grupta bebek kilosu ve AC ile omuz distosisi arasındaki ilişki irdelenmiştir. AC ölçümünde ideal şartları sağlayan hastalar çalışmaya alınmıştır. İdeal AC ölçüm şartları; fetal abdomenin transvers kesiti alınmalı, mümkün olduğunca sirküler alınmalı, portal sinüs seviyesinde umblikal ven içermeli, mide izlenmeli ve kalp, akciğerler ile böbrekler görüntülenmemelidir. Kaliper cildin dış yüzeyinden elips şeklinde yerleştirilmelidir (9). Tüm ölçümlerde Mindray DC-7 marka ultrasanografi aletinin 3.5 MHz'lik konveks probu kullanılmıştır ve ölçümler transabdominal olarak yapılmıştır. Omuz distosisi tanısı için birincil ve ikincil belirtiler çalışmada referans alınmıştır. Omuz distosisinin birincil belirtisi olarak fetal başın doğumundan sonra 60 saniye içinde gövdenin doğmaması objektif tanı kriteri olarak kullanılmıştır. Omuz distosisini gösteren ikincil belirti ise fetal başın doğduktan sonra annenin perinesine geri çekilmesi olarak tanımlanan "Kaplumbağa işareti" kullanılmıştır. Bu kriterler ile omuz distosisi tanısı konulmuş ve hastalar çalışmaya dahil edilmiştir (10,11). Çalışmamız tek merkezli ve multidisipliner bir çalışmadır.

İstatistiksel Analiz

Çalışmamızın istatistik analizi için SPSS (IBM SPSS for Windows, Ver.26) istatistik paket programı kullanılmıştır. Fetal sonuçlar, anne ve gebelik özelliklerinin karşılaştırılması, kategorik değişkenler için χ^2 testi veya Fisher'in kesin testi ve sürekli değişkenler için Mann-Whitney U testi kullanılmıştır. İstatistiksel anlamlılık $p<0.05$ olarak kabul edilmiştir. Çoklu karşılaştırmaları ayarlamak için gerekli durumlarda Bonferroni düzeltmesi kullanılmıştır.

Etik Kurul Onayı

Araştırmamız için Uşak Üniversitesi Tıp Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulundan Tarih: 02.02.2023, Karar No: 69-69-23 ile izin alınmıştır. Çalışmaya alınan hastalardan gerekli bilgilendirilmiş onam alınmıştır. Çalışmamız Helsinki Deklarasyonunda belirtilen esaslara göre yürütülmüştür.

BULGULAR

Çalışmamız 100 vaka ve 100 kontrol grubu olmak üzere toplam 200 gebe üzerinde yapılmıştır. Çalışmaya alınan hastaların yaş ortalaması 28.1±5.6'dir. Çalışmaya alınan gebelerin fetal abdomen çevresi ultrason ölçüm değeri ortalaması 36.3+1.3 cm'dir. Çalışmaya alınan gebelerin doğum sonrası fetal ağırlık ortalaması 3521.9±353.3 kg'dır. Çalışmaya alınan 8 gebenin anamnezinde bir önceki doğumda da omuz distosisi olduğu saptanmıştır. Genel özellikler Tablo 1'de verilmiştir.

Çalışmamızda omuz distosisi görülen grupta ultrasonda fetal abdomen çevresi ölçümü 37.27±0.5 cm ve üzeri saptanmıştır. Omuz distosisi saptanan grupta fetal abdomen çevresi ölçümü kontrol grubuna kıyasla istatiksel olarak anlamlı yüksek saptanmıştır (p=0.000). Fetal abdomen çevresi ve omuz distosisi arasındaki ilişki Tablo 2'de verilmiştir.

Tablo 1. Genel Özellikler

	Minimum	Maksimum	Ortalama+Std. Deviation
Yaş (Yıl)	19	38	28.1±5.6
Gebelik Haftası	34	42	39.1±1.6
Gravide	1	6	2.48±1.3
Parite	0	4	1.3±1.1
Vücut Kitle İndeksi (VKİ)	18	38	28.04±4.2
Fetal Abdomen Çevresi (cm)	32	38.2	36.3+1.3
Fetal Ağırlık (Kg)	2650	4250	3521.9±353.3
	Sayı (n)	Yüzde (%)	
Önceki Doğumda Omuz Distosisi	8	4	
Ek Hastalık	50	25	
Astım	4	2	
Epilepsi	2	1	
Hipertansiyon	10	5	
Diabetes Mellitus	34	17	
Omuz Distosisi			
Evet	100	50	
Hayır	100	50	
Bebekte Komplikasyon			
Evet	30	15	
Klavikula Fraktürü	22	11	
Brakiyal Pleksus Yaralanması	8	4	
Hayır	170	85	
Annede Komplikasyon			
Evet	16	8	
3. Derece Perine Hasarı	6	3	
4. Derece Perine Hasarı	8	4	
Rektum Hasarı	2	1	
Hayır	184	92	
Toplam	200	100	

Tablo 2. Omuz distosisi fetal abdomen çevresi ve fetal kilo arasındaki ilişki

Omuz Distosisi	Sayı (n)	Yüzde (%)	Fetal Abdomen Çevresi (cm) Ortalama+Std. Deviation	Fetal Kilo (Kg) Ortalama+Std. Deviation
Evet	100	100	37.27±0.5	3795.6±206
Hayır	100	100	35.4±1.2	3248.4±240
P Değeri			**0.000***	**0.235**

*95% Confidence İnterval of the Difference, İndependent Samples Test, P<0.05 değeri anlamlı olarak alınmıştır.

Tablo 3. Omuz distosisi gelişenlerde maternal ve fetal komplikasyon görülme oranı

Omuz Distosisi	Meternal Komplikasyon		Fetal Komplikasyon	
	Sayı (n)	Yüzde (%)	Sayı (n)	Yüzde (%)
Evet	16	8	30	15
Hayır	184	92	170	85
P	**0.001***		**0.000***	

*95% Confidence İnterval of the Difference, Chi-Square Tests, P<0.05 değeri anlamlı olarak alınmıştır.

Tablo 4. Omuz Distosisi ile Diğer Parametreler Arasındaki İlişki

	Omuz Distosisi			
Gravida	Evet		Hayır	
	Sayı (N)	Yüzde (%)	Sayı (N)	Yüzde (%)
1	26	13	36	18
2	28	14	20	10
3	22	11	16	8
4	20	10	18	9
5	4	2	8	4
6	0	0	2	1
P	0.197			
	Omuz Distosisi			
Parite	Evet		Hayır	
	Sayı (N)	Yüzde (%)	Sayı (N)	Yüzde (%)
0	28	14	36	18
1	28	14	20	10
2	32	16	24	12
3	12	6	14	7
4	0	0	6	3
P	**0.047***			
	Omuz Distosisi			
VKİ	Evet		Hayır	
	Sayı (N)	Yüzde (%)	Sayı (N)	Yüzde (%)
18.5 ve Altı	0	0	6	3
18.5-24.9	2	1	20	10
25-29.9	62	31	52	26
30-34.9	26	13	14	7
35-39.9	10	5	8	4
40 ve Üzeri	0	0	0	0
P	**0.002***			
	Omuz Distosisi			
Diabetes Mellitus	Evet		Hayır	
	Sayı (N)	Yüzde (%)	Sayı (N)	Yüzde (%)
Evet	24	12	10	5
Hayır	76	38	90	45
P	**0.015***			

*95% Confidence İnterval of the Difference, Chi-Square Tests, P<0.05 değeri anlamlı olarak alınmıştır.
VKİ: Vücut Kitle İndeksi

Çalışmamızda vaka grubu ile kontrol grubu arasında fetal ağırlık ile omuz distosisi arasında istatiksel olarak anlamlı bir ilişki saptanmamıştır (p=0.235). Fetal ağırlık ve omuz distosisi arasındaki ilişki Tablo 2'de verilmiştir.

Omuz distosisi görülen gebelerde görülmeyen gebelere kıyasla fetal komplikasyon görülme oranları istatiksel olarak anlamlı yüksek bulunmuştur (p=0.000). Yine omuz distosisi görülen gebelerde görülmeyen gebelere kıyasla maternal komplikasyon görülme oranları istatiksel olarak anlamlı yüksek bulunmuştur (p=0.001). Omuz distosisi görülen gebelerde maternal ve fetal komplikasyonlar Tablo 3'de verilmiştir.

Hastalarda ek parametrelere bakıldığı zaman gravida sayısı ile omuz distosisi arasında ilişki saptanmamıştır (p=0.197). Hastalarda parite sayısı artıkça omuz distosisi görülme oranı istatiksel olarak anlamlı yüksek bulunmuştur (p=0.047). Hastalarda VKİ değeri arttıkça obez grupta omuz distosisi istatiksel olarak daha yüksek saptanmıştır (p=0.002). Yine diabetes mellitus tanılı hastalarda omuz distosisi diabetik olmayan gruba göre yüksek saptanmıştır (p=0.015). Ek parametreler ve omuz distosisi arasındaki ilişki Tablo 4'de verilmiştir.

TARTIŞMA

Omuz distosisi, fetüs ve pelvik kavite arasındaki uyumsuzluk sonucunda oluşmaktadır. Omuz distosisinde, ön omuz pubise ve arka omuz da promontoryuma takılabilir. Fetüsün inişi sırasında omuzlar ön-arka (anterior-posterior) çapa paralel olursa ya da pelvik girime sırayla değil de aynı anda girerse, ön omuz simfizis pubisin arkasında, arka omuz da sakral promontoryumda sıkışabilir. Ön omuz distosisi, arka omuz distosisine göre daha sık görülmektedir (9-12).

Distosi doğumlarda sık olarak karşılaşılan gerekli önlemler ve uygulamalar ile doğumun normal olarak gerçekleştirilebildiği fakat uygun müdahale olmadığında mortalite ve morbiditesi yüksek bir sorun olarak karşımıza çıkmaktadır. Fetal başın toraks/karın oranı makrozominin ötesinde omuz distosisinin gelişiminde önemli bir faktör gibi görünmektedir. Ancak bu parametrenin pozitif öngörü değeri çok düşük (%7.55) olduğundan omuz distosisi için bir tarama aracı olarak uygulanması ise literatürde önerilmemektedir (12-14). Bizim çalışmamız fetal başın toraks/karın oranı üzerine değildir. Çalışmamızda fetal abdomen çevresinin ultrason ölçümü ile omuz distosisi arasındaki ilişki araştırılmıştır. Çalışmamızda omuz distosisi görülen grupta fetal abdomen çevresi ölçümü ortalaması 37.27±0.5 cm olarak saptanmıştır ve kontrol grubuna göre istatistiksel olarak anlamlı şekilde yüksek izlenmiştir (p=0.000).

Fetal makrozomi omuz distosisi için eskiden kabul gören bir risk faktörü olmasına rağmen omuz distosilerinin çoğunluğu makrozomik olmayan fetüslerde görülmektedir (15). Yine literatüre uygun olarak çalışmamızda vaka grubu ile kontrol grubu arasında fetal ağırlık ile omuz distosisi arasında bir ilişki saptanmamıştır.

Annedeki gestasyonel diabetin fetal makrozomiye ek olarak bağımsız bir risk faktörü olduğunun gösterilmesi diabetik anne bebeklerinde gövde lehine orantısızlık olduğunu ortaya koymuştur (15).

M B McFarland ve arkadaşları diabetik anne bebeklerinde yaptıkları çalışmada diabetik annelerin makrozomik bebekleri daha geniş omuz ve ekstremite çevreleri, azalmış baş-omuz oranı ve daha yüksek vücut yağı oranlarına sahip olduklarını göstermişlerdir. Yine diabetik anne bebeklerinin benzer doğum ağırlığına ve doğum uzunluğuna sahip diabetik olmayan kontrol bebekleriyle karşılaştırıldığında daha kalın üst ekstremite deri kıvrımlarına sahip olduklarını saptamışlardır (16).

HD Modanlu ve arkadaşları 1960'tan 1980'e Memorial Hastanesi Tıp Merkezi-Miller Çocuk Hastanesi'nde omuz distosisi ile ilgili bir çalışma yapmışlardır. Bu çalışmada omuz distosisi yaşayan yenidoğanların doğum eyleminde başarısız ilerleme nedeniyle sezaryenle doğurtulan makrozomik yenidoğanlara veya omuz distosisi olmadan doğan makrozomik yenidoğanlara göre önemli ölçüde daha fazla omuz-kafa ve göğüs-kafa orantısızlığına sahip olduğunu ortaya koymuşlardır (17). Bizim çalışmamız antropometrik ölçümlerin birbirine oranından ziyade klinik pratik kullanımı daha kolay olan ultrasonda fetal abdomen çapı üzerine yapılmıştır. Pratik kullanım açısından literatüre katkı sunacak nitelikte bir çalışmadır.

Cohen ve arkadaşları karın çapı ile biparietal çap arasındaki farkın omuz distosisini saptamada ki yeri ile ilgili bir çalışama yapmışlardır. Karın çapı ile biparietal çap arasındaki farkın 26 mm'lik bir kesme değerinde omuz distosisi tahmin değerinin anlamlı olduğunu belirtmişlerdir (18).

Gökmen SUKGEN ve Ünal TURKAY Türkiye'de yaptıkları bir çalışmada omuz distosisi gelişen grupta fetal abdominal çevreyi daha büyük ölçmüşlerdir. Bu çalışmada doğumda distosi gelişen gebelerin yapılan ultrasonografik incelemesinde ölçülen fetüs AC çap değeri, distosi gelişmeyen gebelerden (38.07±2.56) anlamlı olarak yüksek saptanmıştır (p=0.04) (19). Bizim çalışmamızda da fetal abdomen çevresi omuz distosisi gelişen grupta daha yüksek bulunmuştur.

Omuz distosi çeşitli majör ve minör risk faktörleri olsa da halen öngörülemez ve engellenemez bir obstetrik acildir. Acker'ın diabetik olmayan ve 4500 gram üzerinde doğum yapan gebelerin katılımı ile gerçekleştirdiği çalışmasında; bebeklerden 4000 gramdan az

olanlarda omuz distosisi sıklığını %1.1 olarak belirtilir iken, ağırlık 4500 gramın üzerine çıktığında omuz distosisinin %22 oranında gözlendiği belirtilmiştir (20).

Gümüş ve arkadaşları 537 gebe üzerinde yaptıkları çalışmada gebeleri vücut kitle indeksi (VKI) değerlerine göre gruplara ayırarak gebelik ve doğum çıktılarını değerlendirmişler ve obez hastaların makrozomik bebek ve omuz distosisi gelişme riskinde anlamlı bir artış tespit etmişlerdir (21). Bizim çalışmamızda kilo ile omuz distosisi arasında bariz kesme değeri saptanmamıştır.

Daly ve ark. yaptıkları çalışmada nullipar hastalarında omuz distosisi riskinin anlamlı olarak yüksek olduğunu tespit etmişlerdir (22). Bizim çalışmamız fetal abdomen çevresine odaklı olup hastalar nullipar-multipar diye ayrılmamıştır.

Moore ve ark. vajinal doğum yapmış 9967 kadın üzerinde yaptıkları çalışmalarında omuz distosisi için en önemli risk faktörlerinin obezite, multiparite, annenin boyunun 1,5 m altında olması ve anne boyu/bebek ağırlık oranı olduğunu saptamışlardır. Ayrıca parite sayısı arttıkça riskin azaldığını ifade etmişlerdir ($p<0.05$) (23). Bizim çalışmamızda kilo ile omuz distosisi arasında bir ilişki saptanmamıştır. Çalışmamızda ultrasonda fetal abdomen çapı ölçümü ile omuz distosisi arasında ilişki saptanmıştır. Yine omuz distosisi gelişen gebelerde maternal ve fetal komplikasyon oranları yüksek saptanmıştır.

Yapılan çalışmalarda, önceki doğumunda omuz distosisi öyküsü olan kadınların %1-25'inin tekrar distosi ile karşılaşabilecekleri belirtilmektedir (24,25). Bizim çalışmamızda da sekiz hastanın daha önceden omuz distosisi öyküsü mevcut idi.

Çalışmamız mevcut literatür ile uyumlu olup literatüre katkı sunacak niteliktedir. Çalışmamızda omuz distosisi görülen grupta fetal abdomen çevresi ölçümü ortalaması 37.27±0.5 cm olarak saptanmıştır ve kontrol grubuna göre istatistiksel olarak anlamlı şekilde yüksek izlenmiştir. Fakat fetal kilo ile omuz distosisi arasında istatiksel ilişki saptanmamıştır. Yine omuz distosisi olan gebelerde maternal-fetal komplikasyonlar literatür ile uyumlu olarak yüksek saptanmıştır.

SONUÇ

Çalışmamızda omuz distosisi görülen grupta fetal abdomen çevresi ölçümü ortalaması 37.27±0.5 cm olarak saptanmıştır ve kontrol grubuna göre istatistiksel olarak anlamlı şekilde yüksek izlenmiştir. Çalışmamızda fetal doğum ağırlığı ile omuz distosisi arasında herhangi bir ilişki saptanmamıştır. Omuz distosisi görülen doğumlarda maternal ve fetal komplikasyonlar ise anlamlı derecede artmaktadır. Fetal abdomen çevresi ölçümü doğum öncesi omuz distosisi ön görüsünde klinisyenlere yardımcı olabilir.

KAYNAKLAR

1. Lerner H. Can shoulder dystocia be resolved without fetal injury when it does occur? http://www.shoulderdystociainfo.com/resolvedwithoutfetal.htm, 2006.
2. Gherman RB, Chauhan S, Ouzounian JG, et al. Shoulder dystocia: the unpreventable obstetric emergency with empiric management guideline. J. Obstet. Gynecol. 2006;195:657-72.
3. Beall MH, Spong C, McKay J, et al. Objective definition of shoulder dystocia: a prospective evaluation. Am. J. Obstet. Gynecol. 1998;179:934-7.
4. Athukorala C, Middleton P, Crowther CA. İntrapartum interventions for preventing shoulder dystocia (review). The Cochrane Collaboration. Issue 4, 2009.
5. Moore HM, Reed SD, Batra M, et al. Risk factors for recurrent shoulder dystocia. Am. J. Obstet. Gynecol. 2008;198;16-24.
6. Nesbitt TS, Gilbert WM, Herrchen B. Shoulder dystocia and associated risk factors with macrosomic infants born in California. Am. J. Obstet. Gynecol. 1998;179:476-80.
7. Cohen B, Penning S, Major C, et al. Sonographic prediction of shoulder dystocia in infants of diabetic mothers. Obstet. Gynecol. 1996;88:10-3.
8. Jazayeri A, Heffron JA, Phillips R, et al. Macrosomia prediction using ultrasound fetal abdominal circumference of 35 centimeters or more. Obstet. Gynecol. 1999;3:523-6.
9. Cetin I, Boito S, Radaelli T. Evaluation of fetal growth and fetal well-being. Semin Ultrasound CT MR. 2008 Apr;29(2):136-46. doi: 10.1053/j.sult.2008.01.002. PMID: 18450139.
10. Gherman RB, Chauhan S, Ouzounian JG, Lerner H, Gonik B, Goodwin TM. Shoulder dystocia: the unpreventable obstetric emergency with empiric management guidelines. Am J Obstet Gynecol 2006; 195: 657-72
11. Kim SY, Sharma AJ, Sappenfield W, Wilson HG, Salihu HM. Association of maternal body mass index, excessive weight gain, and gestational diabetes mellitus with large-for-gestational-age births. Obstetrics & Gynecology. 2014;123(4):737-44
12. Cohen B, Penning S, Major C, Ansley D, Porto M, Garite T. Sonographic prediction of shoulder dystocia in infants of diabetic mothers. Obstet Gynecol. 1996;88(1):10-13. doi:10.1016/0029-7844(96)00067-1
13. Miller RS, Devine PC, Johnson EB. Sonographic fetal asymmetry predicts shoulder dystocia. J Ultrasound Med. 2007;26(11):1523-1528. doi:10.7863/jum.2007.26.11.1523
14. Rajan PV, Chung JH, Porto M, Wing DA. Correlation of increased fetal asymmetry with shoulder dystocia in the nondiabetic woman with suspected macrosomia. J Reprod Med. 2009;54(8):478-482.
15. Langer O, Berkus MD, Huff RW, Samueloff A. Shoulder dystocia: should the fetus weighing greater than or equal to 4000 grams be delivered by cesarean section?. Am J Obstet Gynecol. 1991;165(4 Pt 1):831-837. doi:10.1016/0002-9378(91)90424-p
16. McFarland MB, Trylovich CG, Langer O. Anthropometric differences in macrosomic infants of diabetic and nondiabetic mothers. J Matern Fetal Med. 1998;7(6):292-295. doi:10.1002/(SICI)1520-6661(199811/12)7:6<292::AID-MFM7>3.0.CO;2-A
17. Modanlou HD, Komatsu G, Dorchester W, Freeman RK, Bosu SK. Large-for-gestational-age neonates: anthropometric reasons for shoulder dystocia. Obstet Gynecol. 1982;60(4):417-423.
18. Cohen B, Penning S, Major C, Ansley D, Porto M, Garite T. Sonographic prediction of shoulder dystocia in infants of diabetic mothers. Obstet Gynecol. 1996;88(1):10-13. doi:10.1016/0029-7844(96)00067-1

19. Sukgen, G. & Turkay, Ü. (2020). VAJİNAL DOĞUM SIRASINDA İSTENMEYEN DURUMLAR: OMUZ DİSTOSİSİ Uncertainted Cases During Vaginal Birth: Shoulder Dystocia . Bozok Tıp Dergisi , 10 (4) , 7-14 . Retrieved from https://dergipark.org.tr/en/pub/bozoktip/issue/58046/841596

20. Macrosomia: ACOG Practice Bulletin, Number 216. Obstet Gynecol. 2020;135(1):e18-e35. doi:10.1097/AOG.0000000000003606

21. Nesbitt TS, Gilbert WM, Herrchen B. Shoulder dystocia and associated risk factors with macrosomic infants born in California. Am J Obstet Gynecol. 1998;179(2):476-480. doi:10.1016/s0002-9378(98)70382-5

22. Daly MV, Bender C, Townsend KE, Hamilton EF. Outcomes associated with a structured prenatal counseling program for shoulder dystocia with brachial plexus injury. Am J Obstet Gynecol. 2012;207(2):123.e1-123.e1235. doi:10.1016/j.ajog.2012.05.023

23. Moore HM, Reed SD, Batra M, Schiff MA. Risk factors for recurrent shoulder dystocia, Washington state, 1987-2004. Am J Obstet Gynecol. 2008;198(5):e16-e24. doi:10.1016/j.ajog.2007.09.050

24. Tokmak A. , Tekin Ö. M. , Özcan K. N. , Erkaya S. Vajinal Doğumun Korkulan Komplikasyonu: Omuz Distosisi. Jinekoloji-Obstetrik ve Neonatoloji Tıp Dergisi. 2016; 13(4): 176-183.

25. Gurewitsch Allen ED. Recurrent Shoulder Dystocia: Risk Factors and Counseling. Clin Obstet Gynecol. 2016;59(4):803-812. doi:10.1097/GRF.0000000000000229

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Jinekolojik onkoloji hastalarının destekleyici bakım gereksinimleri ve etkileyen faktörler

Supportive care needs of patients with gynecological oncology and affecting factors

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ÖZ

Amaç: Kanser hastalarının pek çok alanda destekleyici bakıma gereksinimi vardır.Çalışmada jinekolojik onkoloji hastalarının destekleyici bakım gereksinimlerinin ve etkileyen faktörlerin belirlenmesi amaçlanmıştır.

Gereç ve Yöntemler: Tanımlayıcı-kesitsel tipteki çalışma jinekolojik kanser tanısı almış ve iki hastanenin gündüz ve ayaktan tedavi birimlerine kemoterapi ve/veya radyoterapi için başvuran, gönüllü 195 kadın hasta ile yürütülmüştür. Veriler "Tanıtıcı Bilgi Formu" ve "Destekleyici Bakım Gereksinimleri Ölçeği-Kısa Formu (DBGÖ-KF)" ile toplanmıştır.

Bulgular: Jinekolojik onkoloji hastalarının DBGÖ-KF puan ortalaması 77,74±16,14 dür. Özellikle hastaların ruhsal/psikolojik, sağlık hizmeti ve bilgilendirme ve fiziksel/günlük yaşamalanlarında daha fazla destekleyici bakım gereksinimlerinin olduğu ve karşılanmamış olduğu belirlenmiştir. Hastaların yaş, eğitim düzeyi, çalışma durumu, maddi durum algısı, çocuk varlığı, çocuk sayısı, kemoterapi kür sayısı, kanser tipi ve tedavi türü değişkenlerinin destekleyici bakım gereksinimleri üzerinde istatistiki yönden anlamlı bir etkinliğinin olduğu saptanmıştır ($p<0.05$).

Sonuç: Kadınların destekleyici bakım gereksinimlerinin orta düzeyde olduğu belirlenmiştir. En fazla destekleyici bakım gereksinimleri ruhsal/psikolojik, sağlık hizmeti ve bilgilendirme vegünlük yaşam alanlarındadır. Karşılanmamış bakım gereksinimleri yaş, eğitim düzeyi, çalışma durumu, maddi durum algısı, çocuk varlığı, çocuk sayısı, kemoterapi kür sayısı ve tedavi türünegöre farklılık göstermektedir. Sağlık çalışanları kadınların ve onlara destek sağlayanların değer, inanç ve kültürel özelliklerine göre destekleyici bakım gereksinimlerini belirlemeli etkili bir şekilde yönetilmesini sağlamalı, yaşam kalitesini yükseltmek için gereksinimlere yönelik girişimlerplanlamalıdır.

Anahtar Kelimeler: Destekleyici bakım gereksinimi, jinekolojik onkoloji, sağlık profesyoneli

ABSTRACT

Aim: Cancer patients need supportive care in many areas. In the study is to determine the supportive care needs of gynecology oncology patients and the affecting factors.

Materials and Methods: The descriptive cross-sectional study was conducted with 195 female patients who were diagnosed with gynecological cancer and applied to the day and outpatient units of two hospitals for chemotherapy and/or radiotherapy. The data were collected with the "Descriptive Characteristics Form" andthe "Short Form of the Supportive Care Needs Scale (SCNS-SF)".

Results: The mean SCNS-SF score of gynecological oncology patients was 77.74±16.14. It has been determined that the patients have more supportive care needs that are not met, especially in the areas of mental/psychological, health care and information, and physical/daily life. It was determined that the variables of age, education level, employment status, financial situation perception, presence of children, number of children, number of chemotherapy cycles, type of cancer and type of treatment had a statistically significant effect on the supportive care needs of the patients ($p<0.05$).

Conclusion: It was determined that the supportive care needs of women were moderate. The most supportive care needs are in the areas of mental/psychological, health care, and informing and daily life. Unmet care needs differ according to age, education level, employment status, perception of financial situation, presence of children, number of children, number of chemotherapy cycles, and disease stage. Healthcare professionals should determine the supportive care needs of women and their supporters according to their values, beliefs, and cultural characteristics, ensure that they are managed effectively, and they should take initiatives to improve the quality of life.

Keywords: Supportive care needs, gynecology oncology, health professional

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GİRİŞ

Hasta merkezli bir yaklaşımla etkili bir biçimde bakım gereksinimlerinin saptanıp karşılanması destekleyici bakım olarak tanımlanmaktadır (1). Destekleyici bakım, kanserle yaşayan veya etkilenen kişilerin, kanser öncesi, teşhis, tedavi ve hayatta kalma sırasındaki fiziksel, psikolojik, ruhsal, cinsel, sosyal, günlük yaşam ve bilgi gereksinimlerini karşılayabilmeleri için gerekli hizmetleri sağlamaya yönelik, hasta merkezli bir yaklaşımdır (2,3).

Destekleyici bakım gereksinimlerinin karşılanması, yaşam kalitesini ve hasta memnuniyetini olumlu yönde etkilemektedir (4). Destekleyici girişimler bütüncül bir şekilde ele alınarak, kanser tedavisinden ayrı düşünülmemeli ve tanı konduğundan itibaren girişimlerin uygulanması çok önemlidir (5). Uygulanacak destekleyici bakım, kanserin her aşamasında hastanın ve ailesinin hastalıkla baş etmesine de yardımcı olacaktır (3,6).

Yapılan çalışmalarda jinekolojik kanserli kadınların farklı alanlarda destekleyici bakım gereksinimlerinin olduğu saptanmıştır. Beesley ve arkadaşlarının (2008) Avusturalya'da jinekolojik kanser tedavisini tamamlamış 802 kadınla yaptıkları çalışmada kadınların karşılanmamış destekleyici bakım gereksinimleri incelenmiş ve %43'ünün orta veya yüksek düzeyde destekleyici bakıma ihtiyacı olduğu saptanmıştır. Ayrıca kanserin yayılmasından korkma, yakınlarının endişelerinden kaygılanma, gelecek hakkında belirsizlik, enerji kaybı/ yorgunluk ve eskiden yaptıkları şeyleri yapamama gibi fiziksel ve psikolojik gereksinimlerin karşılanamamış olduğu da bulunmuştur (7). Steel ve Fitch (2008) Kanada'da jinekolojik kanserli kadınların destekleyici bakım gereksinimlerini saptamak için 103 katılımcıyla yaptıkları araştırmada en fazla bildirilen gereksinimler fiziksel olmayan bakım gereksinimleri olarak saptanmış ve bunların; kanserin tekrardan nüks etmesi ve başka organlara metastaz etmesi ile ilgili endişe, gelecekle ilgili belirsizlikler, yorgunluk, üzüntü, olağan yaşam düzeninde değişiklik, iyileşmeye yardımcı olacak konular hakkında bilgilendirilmek olduğu görülmüştür (8). Fitch ve Steele (2010) Kanada'da over kanseri kadınların en sık belirlenen destekleyici bakım gereksinimlerinin ruhsal/psikolojik ve fiziksel/günlük yaşam alanlarında olduğunu tespit etmişlerdir (9). Avusturalya'da jinekolojik kanserli hastalarla yapılan bir çalışmada da karşılanmamış gereksinim %55,6 olarak saptanmıştır. En çok karşılanmamış beş gereksinim; kaygıları yönetmek için yardım, bakımını düzenlemek için tüm doktorlarla konuşabilme, hayatında olumsuz şeyler olacağı algısının değişmesine yardım, kanser deneyimi olan kişilerle konuşmak, ihtiyaç duyduklarında hizmetler hakkında bilgi alabilecekleri yetkili yöneticilerle görüşme şeklinde ifade edilmiştir (10). Türkiye'de özellikle jinekolojik kanserli kadınların destekleyici bakım gereksinimlerini saptamaya yönelik mevcut sadece bir tez çalışmasının olduğu görülmüştür (11). Dolayısıyla ülkemizde bu kapsamda yapılan çalışma oldukça sınırlıdır.

Destekleyici bakım, özellikle multidisipliner bir yaklaşımı gerektirmektedir. Destekleyici bakım doktor, hemşire, psikolog, sosyal hizmet uzmanı gibi sağlık profesyonelleri tarafından uygulanabilir (12). Hemşireler, destekleyici bakım gereksinimlerinin belirlenmesinde ve ihtiyaçların giderilmesinde kilit bir role sahiptir. Yapılan her türlü girişime ilişkin hastaya bilgi verilmesi, bireysel özelliklere özen gösterilmesi, karşılanmayan ihtiyaçların karşılanması ve destek verilmesi, hastalık ile baş etmesine yardımda bulunulması, bireyler arası etkili iletişimi sağlaması hemşirelerin öncelikli sorumluluklarındandır ve bu girişimler hemşireliğin sanat yönünü oluşturmaktadır (13).

Bu çalışmanın jinekolojik kanserli kadınların destekleyici bakım gereksinimlerinin belirlenmesine ve kadınların yaşam kalitesinin artırılmasında en çok ihtiyaç duyulan alanların saptanmasına katkı sağlayacağı düşünülmektedir. Çalışmada amaç jinekolojik onkoloji hastalarının destekleyici bakım gereksinimlerini ve etkileyen faktörleri incelemektir.

YÖNTEM

Araştırma tanımlayıcı kesitsel tiptedir. Araştırma Türkiye'nin batısında bir ildeki iki hastanenin gündüz tedavi bakım merkezine kemoterapi ve/veya radyoterapi tedavisi için başvuran jinekolojik kanser tanısı almış örneklem kriterlerine uyan gönüllü kadın hastalarla yapılmıştır. Araştırmada veriler Temmuz 2019 –Nisan 2022 tarihlerinde toplanmıştır. Araştırmada "G.Power-3.1.9.2" programı kullanılarak, %95 güven düzeyinde örneklem büyüklüğü hesaplanmıştır. Analiz sonucunda α=0,05 düzeyinde, Lee ve Know'un (2018) (14) çalışmasında yer alan destekleyici bakım gereksinimleri değerleri baz alınarak 0,2 etki büyüklüğü ve 0,95 teorik power ile minimum örneklem hacmi toplamda en az 136 kadın olarak hesaplanmıştır. Çalışma 195 kadın ile sonlandırılmıştır. Elde edilen örneklem büyüklüğü ile yapılacak çalışma sonrasında power (güç) post-hoc yöntemi ile hesaplanarak örneklemin yeterliliği tekrar kontrol edilmiştir. Analiz sonucunda α=0,05 düzeyinde, çalışmadan elde edilen etki büyüklüğü 0,428 ve örneklem hacmi toplamda 195 kişi ile güç 0,99 olarak hesaplanmıştır. Analiz sonucunda örneklemin yeterli olduğu tespit edilmiştir. Çalışmanın dahil edilme kriterleri;en az iki ay önce tanı almış olmak, kemoterapi/radyoterapi tedavisine başlamış olmak, Türkçe anlayabilme ve konuşabilme ve çalışmaya katılmaya gönüllü olmaktır. Jinekolojik kanser tanısından önce psikiyatrik tanısı olanlar ve kanser dışında kronik bir hastalığa sahip olanlar araştırmanın dışında kalmıştır.

Veri Toplama Araçları

Araştırmada Tanıtıcı Bilgi Formu ve Destekleyici Bakım Gereksinimleri Ölçeği-Kısa Formu kullanılmıştır.

Tanıtıcı Bilgi Formu: Literatür doğrultusunda yapılandırılmıştır. Yaş, eğitim durumu, çalışma durumu, gibi sosyodemografi özellikleri ve jinekolojik kansere ilişkin bilgileri içeren toplam 15 sorudan oluşmuştur (4,8,9).

Destekleyici Bakım Gereksinimleri Ölçeği Kısa Form (DBGÖ-KF): Kanser tanısı alan bireylerin ihtiyaçlarını belirlemek ve değerlendirmek için Boyes, Girgis ve Lecathelinais (2009) tarafından geliştirilmiştir (15). Türkçe geçerlik ve güvenirliği Aksuoğlu ve Şenturan (2016) tarafından yapılmış ve Cronbach alfa değeri ise 0,97 olarak bulunmuştur. Ölçek beş alt boyuttan (ruhsal/psikolojik; sağlık sistemi vebilgilendirme; hasta bakım ve desteği; fiziksel/ günlük yaşam; cinsellik) ve 31 maddeden oluşmaktadır. Ölçek beşli Likert tipindedir 'hiç ihtiyacım olmadı (1 puan), ihtiyacım olmadı (2 puan), az ihtiyacım oldu (3 puan), biraz ihtiyacım oldu (4 puan), çok fazla ihtiyacım oldu (5 puan) şeklinde puanlanmaktadır. Ölçekten alınan en düşük 31, en yüksek 155 puandır. Her bir alt boyuttan alınan puanın yüksekliği o alandaki destekleyici bakım ihtiyacının fazlalığına, destekleyici bakım gereksinimlerinin karşılanmamış olduğuna işaret etmektedir(16). Çalışmamızda ölçeğe ait Cronbach alfa değeri 0,89 olarak hesaplanmıştır.

Araştırmanın uygulanması

Araştırma örneklemine alınacak jinekoloji onkoloji hastalarına çalışmanın amacı açıklandıktan sonra gönüllü katılmayı kabul edenlerden bilgilendirilmiş onam formu imzalatılmıştır. Veriler yüz yüze görüşme tekniğiyle uygun bir ortamda elde edilmiştir. Görüşmeler ortalama 20 dakika sürmüştür.

İstatistiksel Değerlendirme

Çalışmada toplanan verilerin analizi, istatistiksel yazılım paketi SPSS 25 (Statistical Package for the Social Sciences – IBM®) programı kullanılarak yapıldı. Çalışmada bağımsız değişkenlere verilen yanıtların dağılımına ilişkin tanımlayıcı istatistikler, kategorik değişkenler için sayı ve yüzdeler, sayısal değişkenler için ortalama, standart sapma ve ortanca olarak sunuldu. Sürekli değişkenlerin normal dağılım varsayımına uygunluğu Kolmogorov-Smirnow testi ile değerlendirilmiştir. Niceliksel verilerin karşılaştırılmasında iki grup arasındaki fark normal dağılıma sahip ölçümler için bağımsız örneklem t testi, normal dağılıma sahip olmayan ölçümler için ise Mann Whitney U testi kullanılmıştır. En az üç bağımsız grup için normal dağılıma sahip ölçümler için varyans analizi (ANOVA), normal dağılıma sahip olmayanlar için ise Kruskal Wallis testi kullanılmıştır. Gruplar arasında istatistiksel olarak anlamlı bir fark bulunması durumunda, farkın hangi iki grup arasında farklılık olduğunun tespit edilebilmesi için Bonferroni analizi yapılmıştır. İstatistiksel anlamlılık düzeyini belirlemek için, %95 güven aralığında $p<0.05$ anlamlı kabul edildi.

Araştırmaya başlamadan önce ilgili üniversitenin girişimsel olmayan araştırmalar Etik Kurulundan onay (2019/16-28 karar numarası ve 4805-GOA protokol numarası) alınmıştır. Aynı zamanda ilgili kurumlardan da çalışmanın yapılabilmesi için izin alınmıştır. Araştırmada kullanılan ölçeğin sahibinden izin alınmıştır. Araştırma Helsinki Deklerasyonu prensipleri doğrultusunda yapılmıştır.

BULGULAR

Kadınların tanıtıcı özellikleri Tablo 1'de yer almaktadır. Kadınların ortalama yaşı 56.27 +12.48 (min:18-max:81) olup, %44,6'sının 50-65 yaş aralığında, %46,7'sinin ilkokul mezunu, %75,4'ünün evli, %88,7'sinin çocuğunun olduğu, %60,1'inin 1-2 çocuğa sahip olduğu, %85,6'sının çalışmadığı ve %50,3'ünün maddi durumunu 'gelir giderden az' olarak algıladığı belirlenmiştir.

Kadınların %55,4'ünün tanısı over kanseri olup, kanserlerin evrelerine göre dağılımları incelendiğinde %40,5'inin evre III, %27,2'sinin evre IV olduğu, %74,4'ünün ilk kez tanı aldığı, %52,8'inin bir yıldan az hastalık süresine sahip olduğu saptanmıştır. Bugüne kadar aldıkları tedavi türleri incelendiğinde kadınların %48,2'sinin cerrahi ve kemoterapialdığı belirlenmiştir (Tablo 1).

Araştırmaya katılan hastaların destekleyici bakım gereksinimleri ölçeğindenaldıkları toplam ve alt boyut puan dağılımları Tablo 2'de yer almaktadır. Katılımcıların DBGÖ- KF ölçeğindenaldıkları toplam puan 77,74±16,14 olup destekleyici bakım gereksinimlerinin orta düzeyde olduğu belirlenmiştir. DBGÖ- KF ölçeğinin ruhsal/ psikolojik gereksinimler alt boyutundan 25,38±8,35 puan, sağlık sistemi ve bilgilendirme alt boyutundan 22,15±5,62 puan, fiziksel/ günlük yaşam alt boyutundan 17,32±5,29 puan, hasta bakım ve desteği alt boyutundan 8,96±2,92 puan ve cinsellik alt boyutundan 3,92±2,13 puan aldıkları tespit edilmiştir Hastaların hasta bakım ve desteği ve cinsellik dışındaki ruhsal/psikolojik, sağlık hizmeti ve bilgilendirme ve fiziksel/günlük yaşam alanlarındaki destekleyici bakım gereksinimlerinin fazla olduğu ve karşılanmamış olduğu belirlenmiştir (Tablo 2).

Kadınların tanımlayıcı özelliklerine göre DBGÖ-KF puan ortalamalarının karşılaştırılması Tablo 3 de yer almaktadır. Tabloya göre; katılımcıların yaşlarına göre DBGÖ-KF alt boyutlarından cinsellik ve hasta bakım ve desteği boyutlarından aldıkları puanlar arasında anlamlı farklılık saptanmış ve cinsellik ($p=0,001$) ve hasta bakım ve desteği ($p=0,006$) alt boyutlarından alınan puanların 18-49 yaş aralığında olan hastalarda daha yüksekolduğu ve bu

Tablo 1. Jinekolojik onkoloji hastalarının tanımlayıcı özellikleri (n=195)

Tanımlayıcı Özellikler		n	%
Yaş	18-49 yaş	58	29,7
	50-65 yaş	87	44,6
	66 yaş ve üstü	50	25,6
Eğitim durumu	Okuryazar değil	15	7,7
	Okuryazar	18	9,2
	İlkokul	91	46,7
	Ortaöğretim/lise	49	25,1
	Üniversite	22	11,3
Medeni durum	Evli	147	75,4
	Bekar	48	24,6
Çalışma durumu	Evet	28	14,4
	Hayır	167	85,6
Maddi durum	Gelir gidere eşit	87	44,6
	Gelir giderden az	98	50,3
	Gelir giderden fazla	10	5,1
Çocuk varlığı	Evet	173	88,7
	Hayır	22	11,3
Çocuk sayısı	1-2	104	60,1
	3 ve üzeri	69	39,9
Tanı	Over kanseri	108	55,4
	Endometrium kanseri	61	31,3
	Serviks kanseri	20	10,3
	Vulva kanseri	3	1,5
	Vajina kanseri	3	1,5
Hastalık evresi	Evre I	18	9,2
	Evre II	45	23,1
	Evre III	79	40,5
	Evre IV	53	27,2
Tanı aşaması	İlk tanı	145	74,4
	Nüks	50	25,6
Hastalık süresi	1 yıldan az	103	52,8
	1-5 yıl	76	39,0
	5 yıldan fazla	16	8,2
Şu anda alınan tedavi türü	Kemoterapi Kemoterapi ve radyoterapi	182 13	93,3 6,7
Daha önce alınan tedavi türleri	Cerrahi	25	12,8
	Kemoterapi	47	24,1
	Cerrahi ve kemoterapi	94	48,2
	Kemoterapi ve radyoterapi	8	4,1
	Hepsi	21	10,8
Kemoterapide kür sayısı	1.kür	22	11,3
	2.kür	24	12,3
	3.kür	37	19,0
	4.kür	30	15,4
	5.kür	22	11,3
	6.kür	12	6,2
	6 kür üzeri	48	24,6
Tedavi sürecinde destek olan kişinin varlığı	Var	190	97,4
	Yok	5	2,6

Tablo 2. Katılımcıların destekleyici bakım gereksinimleri ölçeğinden aldıkları toplam ve alt boyut puan dağılımları (n=195)

Ölçek Alt Boyutları	Min	Medyan	Max	$\overline{xx}$±ss
Fiziksel/günlük yaşam	5,00	18,00	25,00	17,32±5,29
Ruhsal/psikolojik	9,00	25,00	45,00	25,38±8,35
Cinsellik	3,00	3,00	15,00	3,92±2,13
Hasta bakım ve desteği	4,00	8,00	16,00	8,96±2,92
Sağlık sistemi ve bilgilendirme	10,00	21,00	46,00	22,15±5,62
Toplam puan	41,00	77,00	119,00	77,74±16,14

alandaki gereksinimlerin karşılanmadığı görülmüştür. Kadınların eğitim düzeylerine göre DBGÖ-KF cinsellik alt boyutundan aldıkları puanlar arasında istatistiki anlamlılık tespit edilmiştir (p=0,000). Cinsellik alt boyutundan alınan puanın üniversite mezunu olan kadınlarda daha yüksek olduğu ve bu alandaki gereksinimin fazla olduğu belirlenmiştir. Kadınların çalışma durumlarına göre DBGÖ-KF fiziksel/günlük yaşam (p=0,033) ve cinsellik (p=0,000) alt boyutlarından aldıkları puanlar arasında istatistiki farklılığın olduğu veçalışmayan hastalarda fiziksel/günlük yaşam gereksinimlerinin fazla olduğu ve karşılanmadığı, çalışan hastaların da cinsellik gereksinimlerinin fazla olduğu ve karşılanmadığı tespit edilmiştir. Maddi durum algısına göre DBGÖ-KF fiziksel/günlük yaşam (p=0.000), ruhsal/psikolojik (p=0,002) ve cinsellik (p=0,006) alt boyutlarındaistatistiksel anlamlı farklılık saptanmışve fiziksel/günlük yaşam ve ruhsal/psikolojik gereksinimlerin gelirini giderden az olarak algılayan kadınlarda daha fazla olduğu ve karşılanmadığı tespit edilmiştir. Cinsellik alt boyutu puanlarının ise geliri gidere eşit olarak algılayan kadınlarda daha fazla olduğu ve gereksinimlerin karşılanmadığı görülmüştür (Tablo 3). Hastalardan çocuğu olmayanların hasta bakım ve destek gereksiniminin daha fazla olduğu ve karşılanmadığı tespit edilmiştir (p=0,018). Ayrıca çocuk sayısı üç ve üzeri olan hastaların fiziksel/günlük yaşama (p=0,025) ilişkin gereksinimlerinin daha fazla olduğu ve karşılanmadığı da saptanmıştır. Katılımcıların tanılarına göre DBGÖ-KF toplam puanı (p=0,001) ve fiziksel/günlük yaşam (p=0,023), ruhsal/psikolojik (p=0,005), cinsellik (p=0,001) ve sağlık sistemi ve bilgilendirme (p=0,032) alt boyutlarından alınan puanlar arasında istatistiksel olarak anlamlı farklılık olduğu tespit edilmiştir. DBGÖ-KF için farklılığın over kanseri ile endometrium kanseri ve over kanseri ile vulva/vajina kanseri arasında olduğu, endometrium ve vulva/vajina kanseri olan kadınlarınover kanseri olan kadınlara göre puanının yüksek olduğu ve destekleyici bakıma daha fazla gereksinimi olduğu görülmektedir. Fiziksel/günlük yaşam ve ruhsal/psikolojik alt boyutpuanlarının endometriumkanseri olan kadınlarda over kanseri olanlara göredaha yüksek olduğu ve bu alanlarda destekleyici bakıma daha fazla gereksinimlerinin olduğu ve gereksinimlerinin karşılanmadığı saptanmıştır. Cinsellik alt boyutu puanlarınınise serviks kanseri ve vulva/vajina kanseri olan kadınlarındiğer iki kansere göre daha yüksek olduğu ve bu alanda destekleyici bakıma daha fazla gereksinimleri olduğu belirlenmiştir. Vulva/vajina kanseri olan kadınların ayrıca sağlık sistemi ve bilgilendirme alanında da puanlarının yüksek olduğu ve bu alanda da karşılanmamış gereksinimlerinin olduğu görülmüştür (Tablo 3).

Katılımcıların kemoterapi tedavisinin kür sayısı ile DBGÖ-KF ölçeği toplam puanları arasında istatistiki anlamlı farklılığın bulunduğu gözlenmiştir (p=0,044). 5.kür kemoterapi alanların 7 kür üzeri kemoterapi alanlara göre destekleyici bakım gereksinimlerinin daha fazla olduğu saptanmıştır. Ayrıca kemoterapi ve radyoterapi tedavisini birlikte alan kadınların sadece kemoterapi alanlara göre DBGÖ-KF cinsellik alt boyutundan aldıkları puanlar arasında anlamlı farklılığın bulunduğu (p=0,005) ve iki tedaviyi gören kadınların cinsellik gereksinimlerinin daha fazla olduğu dasaptanmıştır (Tablo 3).

TARTIŞMA

Jinekolojik kanserli kadınlar hem tedavi süreci hem de hastalık süreleri boyunca gereksinimlerinin karşılanması için destekleyici bakıma ihtiyaç duymaktadırlar (4). Çalışmamızda jinekolojik onkoloji hastalarının destekleyici bakım gereksinimlerinin orta düzey olduğu (77,74±16,14) saptanmıştır. Aksuoğlu ve Şentürk (2015) yaptığı çalışmada kemoterapi tedavisi gören 340 hastanın DBGÖ-KF puan ortalamasını 101,03±29,19 olarak belirlemiştir (16).Williams ve ark. (2018) jinekolojik kanser tedavisi gören 343 hastanın destekleyici bakım gereksinimlerini incelemişler ve hastaların %83'ünün orta veya yüksek düzeyde bakıma gereksinimlerinin olduğunu bulmuşlardır (17). Çalışmamızın sonucu jinekolojik kanserli hastalara bakım veren hemşirelerin ve diğer sağlık çalışanlarının hasta merkezli çalıştıklarını ve bütüncül bakım uygulamalarını yeterli düzeyde yapabildiklerini düşündürmüştür. Ayrıca hastaların yaklaşık tamamına yakınının tedavi sürecinde kendisine yardım eden birinin varlığı da bu sonuca katkı sağlamış olabilir.

Tablo 3. Jinekolojik onkoloji hastalarının destekleyici bakım gereksinimlerini etkileyen faktörler (n=195)

	Destekleyici Bakım Gereksinimleri Ölçeği											
Bağımsız değişkenler	**Fiziksel/günlük yaşam alt boyut**		**Ruhsal/psikolojik alt boyut**		**Cinsellik alt boyut**		**Hasta bakım ve desteği alt boyut**		**Sağlık sistemi ve bilgilendirme alt boyut**		**Toplam puan**	
	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$
Yaş												
18-49 yaş	15	16.24±4.73	25	24.98±7.99	3	4.62±2.58	10	9.64±3.01	22	23.52±6.68	78	79.00±16.27
50-65 yaş	18	17.68±5.10	26	26.33±8.16	3	3.83±2.09	8	9.11±2.77	20	21.63±4.60	78	78.59±15.22
66 ve üstü	19	17.94±6.10	24	24.20±9.04	3	3.28±1.23	8	7.92±2.85	20	21.48±5.71	76	74.82±17.48
	KW=5,346 p=0,069		F=1,133 p=0,324		KW=13,312 p=**0,001**** 3<1		KW=10,094 p=**0,006*** 3<1		KW=4,268 p=0,118		F=1,116 p=0,330	
Eğitim Durumu												
Okur yazar değil	20	19.60±4.78	33	29.60±8.92	3	3.20±0.56	10	9.27±2.94	23	25.60±8.32	87	87.27±17.59
Okur yazar	19	16.94±6.39	24	23.83±9.52	3	3.33±0.84	8	8.28±3.08	20	20.89±3.55	73	73.28±17.18
İlkokul	18	17.71±5.26	26	26.21±8.04	3	3.59±1.86	8	8.89±2.89	21	21.58±5.64	76	77.99±15.79
Ortaöğretim/lise	17	16.84±5.01	23	24.14±7.58	3	4.10±2.18	8	9.00±2.91	20	21.84±4.37	78	75.92±14.05
Üniversite	14	15.50±5.12	24	23.14±9.13	5	5.86±3.21	10	9.55±3.07	21	23.91±6.35	80	77.95±18.76
	F=1,618 p=0,171		KW=8,196 p=0,085		KW=21,864 p=**0,000**** 1<5 3<5 2<5		KW=2,231 p=0,693		KW=5,803 p=0,214		F=1,844 p=0,122	
Çalışma Durumu												
Evet	15	15.64±4.36	26	26.04±8.90	5	6.04±3.31	10	9.71±2.61	22	23.32±5.83	80	80.75±17.75
Hayır	18	17.60±5.39	25	25.28±8.28	3	3.57±1.63	8	8.84±2.96	20	21.96±5.57	76	77.24±15.86
	U=1749,000 **p=0.033***		t=0,445 p=0.657		U=1288,000 **p=0.000****		U=1878,000 p=0.093		U=1900,000 p=0.112		t=1,065 p=0,288	
Maddi durum algısı												
Gelir gider eşit	16	15.54±5.12	24	23.80±8.63	3	4.40±2.63	8	8.63±3.01	20	22.17±6.10	75	74.55±17.53
Gelir giderden az	20	19.39±4.55	28	27.32±7.83	3	3.48±1.51	9	9.33±2.80	21	22.13±4.91	82	81.64±14.17
Gelir giderden fazla	12	12.50±5.23	20	20.20±6.07	3	4.10±1.73	8	8.30±3.16	19	22.20±8.02	66	67.30±11.48
	F=19,742 **p=0.000**** 1<2 3<2		F=6,448 **p=0.002*** 1<2 3<2		KW=10,374 **p=0.006*** 2<1		KW= 3,219 p=0.200		KW= 1,894 p=0.388		F=7,070 **p=0.001**** 1<2 3<2	
Çocuk varlığı												
Evet	18	17.46±5.35	25	25.42±8.28	3	3.87±2.14	8	8.79±2.83	21	22.09±5.40	77	77.62±15.99
Hayır	17	16.23±4.76	26	25.14±9.07	3	4.32±1.94	11	10.36±3.32	21	22.64±7.19	82	78.68±17.64
	U=1608,000 p=0.236		t=0,148 p=0,883		U=1604,000 p=0.101		U=1319,000 **p=0.018***		U=1830,000 p=0.769		t=-0,289 p=0.773	

KW: Kruskal Wallis testi, F:Varyans analizi ANOVA testi, U:Mann Whitney U testi, t: Bağımsız gruplarda t testi, *p<0,05 ** p<0,001

Tablo 3. devamı

Bağımsız değişkenler	Fiziksel/günlük yaşam		Ruhsal/psikolojik		Cinsellik		Hasta bakım ve desteği		Sağlık sistemi ve bilgilendirme		Toplam puan	
	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$	Medyan	$\overline{xx}_{\pm ss}$
Çocuk sayısı												
1-2	16	16.73±5.37	24	25.25±8.37	8	4.10±2.41	3	8.69±2.87	21	22.54±5.32	76	77.31±16.61
3 ve üzeri	19	18.55±5.17	27	25.67±8.21	8	3.54±1.66	3	8.93±2.78	20	21.42±5.49	77	78.10±15.12
	U=2867,000 **p=0,025***		t=-0,323 p= 0,747		U=3192,000 p=0,084		U=3428,000 p=0,616		U=3187,500 p=0,212		t=-0,319 p=0,750	
Tanı												
Serviks kanseri	18.00	17.60±5.38	27.50	27.80±6.30	3.00	4.60±2.23	10.00	9.90±2.85	21.00	23.95±7.91	83.00	83.85±11.32
Endometrium kanseri	20.00	18.84±5.07	27.00	27.38±6.73	3.00	3.25±0.79	8.00	9.11±2.60	21.00	22.11±5.38	80.00	80.69±13.50
Over kanseri	16.50	16.37±5.29	23.00	23.50±9.08	3.00	3.98±2.25	8.00	8.62±3.06	20.00	21.55±5.13	73.00	74.02±17.16
Vulva/vajina kanseri	16.50	18.00±4.60	31.50	31.00±7.82	7.00	7.50±4.32	10.00	10.50±3.15	27.00	27.50±4.37	98.00	94.50±15.48
	KW=9.523 p=**0.023*** 3<2		KW=13.059 p=**0.005*** 3<2		KW=18.938 p=**0.001*** 2<1 2<4 3<4		KW=5.374 p=0.146		KW=8.838 p=**0.032*** 3<4		F=6.159 p=**0.001*** 3<2 3<4	
Hastalık evresi												
Evre I	16	16,72±4,30	24	23,39±8,93	3,00	3,28±0,83	9,00	9,28±3,83	20	20,39±2,25	75	73,06±14,41
Evre II	18	17,22±5,30	26	25,33±8,16	3,00	4,20±2,44	8,00	8,76±2,79	20	20,93±4,62	75	76,44±15,38
Evre III	17	17,22±5,34	24	25,15±8,02	3,00	3,99±1,98	9,00	9,00±2,58	21	22,49±6,33	77	77,85±15,13
Evre IV	19	17,75±5,62	27	26,45±8,88	3,00	3,81±2,35	9,00	8,98±3,23	22	23,28±5,83	78	80,28±18,58
	KW =1,266 p=0,737		F=0,649p=0,584		KW =4,560p=0,207		KW =0,439p=0,932		KW =3,839p=0,279		F=1,042 p=0,375	
Tanı aşaması												
İlk tanı	18	17,21±5,08	24	25,15±7,93	3	4,03±2,25	9	9,03±2,85	21	22,08±5,32	77	77,50±15,31
Nüks	19	17,62±5,91	28	26,06±9,53	3	3,62±1,71	8	8,78±3,16	20	22,36±6,45	78	78,44±18,50
	t=-0,467 p= 0,641		U=3277,000 p=0,311		U=3298,000 p=0,194		U=3344,000 p=0,410		U=3306,500 p=0,353		t=-0,353 p=0,724	
Hastalık süresi												
1 yıldan az	17	17,36±4,93	24	25,33±8,21	3	3,84±2,00	10	9,29±2,76	21	21,90±5,47	76	77,73±15,51
1-5 yıl	19	17,33±5,88	27	25,71±8,46	3	3,86±2,06	8	8,68±3,09	21	22,61±6,10	78	78,18±17,10
6 yıl ve üzeri	18	17,00±4,90	25	25,19±9,14	3	4,75±3,09	7	8,19±2,99	20	21,63±4,10	73	77,75±16,35
	KW=0,343 p=0,842		KW=0,596 p=0,742		KW=2,415 p=0,299		KW=4,217 p=0,121		KW=0,177 p=0,915		F=0,149 p=0,862	
Şu anda alınan tedavi türü												
Kemoterapi	18	17.35±5.26	25	25.17±8.37	3	3.81±1.95	8	8.98±2.93	21	22.30±5.81	77	77.60±16.10
Kemoterapi ve Radyoterapi	19	16.92±5.96	32	28.38±7.78	4	5.54±3.57	8	8.77±2.89	21	23.23±5.37	82	82.85±16.16
	U=1155,50 p=0,888		t=-1,343 p=0,181		U=777,50 **p=0,005***		U=1151,00 p=0,870		U=1073,50 p=0,576		t=-1,135 p= 0,258	
Kemoterapi kür sayısı												
1 kür	17	16.86±5.14	27	25.68±8.48	3	3.59±1.44	10	9.77±3.01	20	20.27±3.45	75	76.18±14.59
2 kür	18	17.46±5.10	23	25.54±6.46	3	3.13±0,61	8	8.79±3.04	20	23.21±6.78	74	77.13±12.67
3 kür	19	18.49±4.94	26	26.46±8.12	3	3.89±1.60	9	8.84±2.65	21	22.62±7.25	82	80.30±16.55
4 kür	17	17.67±4.46	22	24.60±6.19	3	3.90±1.60	8	8.93±2.49	21	20.93±3.80	75	76.03±8.92
5 kür	18	18.73±5.17	31	29.73±7.20	3	5.14±3.77	10	10.23±3.18	23	24.00±5.55	87	87.82±15.07
6 kür	18	17.75±3.96	27	25.00±10.6	3	3.67±1.50	8	8.92±3.58	20	22.25±6.33	78	77.58±18.20
7 kür ve üzeri	16	15.58±6.26	24	23.44±9.85	3	4.02±2.39	8	8.23±2.89	20	20.02±5.01	75	73.29±19.69
	KW=6,049 p=0,418		KW=8,656 p=0,194		KW=6,055 p=0,417		KW=8,797 p=0,185		KW=5,992 p=0,424		F=2,308 p=**0,044*** 7<5	

KW: Kruskal Wallis testi, F:Varyans analizi ANOVA testi, U:Mann Whitney U testi, t: Bağımsız gruplarda t testi, *p<0,05 ** p<0,001

Karşılanmamış destekleyici bakım gereksinimleri, hastanın iyilik haline ulaşmada gerekli olarak algıladığı hizmet veya desteğin yeterli düzeyde olmamasıdır (18). Çalışmamızda yer alan jinekolojik kanserli hastaların en fazla ruhsal/psikolojik (25,38±8,3), sağlık sistemi ve bilgilendirme (22,15±5,62) ve fiziksel/günlük yaşam(17,32±5,29) alanlarında destekleyici bakım gereksinimlerinin olduğu görülmüştür. Temiz ve Durna (2019) en az iki doz kemoterapi alan 450 hasta üzerinde yaptıkları çalışmada da hastaların en çok günlük yaşam ihtiyaçları alanında ihtiyaçlarını belirttikleri, bunu psikolojik ihtiyaçlarının takip ettiği bulunmuştur (19). Steele ve Fitch (2008) Kanada'da jinekolojik kanserli kadınların destekleyici bakım gereksinimlerini tespit etmek amacıyla 103 katılımcıyla yaptıkları araştırmada en fazla bildirilen gereksinimler fiziksel olmayan gereksinimler olup bunlar; kanserin tekrardan nüks etmesi ve başka organlara metastaz etmesi ile ilgili endişe (psikolojik), geleceği ile ilgili belirsizlikler (spritüal), yorgunluk (fiziksel), üzüntü (psikolojik), yapılan tedavinin sonucunun kendi kontrolü dışında kalmasıyla ilgili kaygıların bulunması (emosyonel), olağan yaşam düzeninde değişiklik (günlük yaşam), iyileşmesine yardımcı olacak şeyler hakkında bilgilendirilmek (bilgisel) olarak saptanmıştır (8).Fitch ve Steele'nin (2010) Kanada'da over kanseri kadınların destekleyici bakım gereksinimlerini belirlemek amacıyla yaptıkları çalışmada, en sık bildirilen destekleyici bakım gereksiniminin ruhsal/psikolojik ve fiziksel/günlük yaşam alanlarında olduğunu tespit etmişlerdir (9). Urbeniec ve arkadaşlarının (2011) Avusturalya'da primer tedavisini tamamlamış jinekolojik kanserli hastalarla yaptıkları çalışmada karşılanmamış gereksinim %55,6 olarak tespit edilmiştir. En çok karşılanmamış beş gereksinim; kaygılarını yönetmek için yardım, bakımını düzenlemek için tüm doktorlarla konuşabilme, hayatında olumsuz şeyler olacağı algısının değişmesine yardım, kanser deneyimi olan kişilerle konuşmak şeklinde ifade edilmiştir (10).Hediya Putri ve ark. (2018) Endonezya'da jinekolojik kanserli hastaların karşılanmamış destekleyici bakım gereksinimlerinin yaşam kalitesiyle ilişkisini saptamak amacıyla yaptıkları çalışmada en fazla karşılanmamış gereksinimin fiziksel/günlük yaşam alanında (%80,4) olduğu, en az gereksinim olan alanın cinsellik olduğu (%35,3) tespit edilmiştir (20). Bu çalışmalardan da görüldüğü gibi çalışmamıza benzer şekilde kanser hastalarının en çok psikolojik, sağlık sistemi ve bilgilendirme ve fiziksel/günlük yaşam alanında destekleyici bakım gereksinimi vardır. Kanserin bireyi en çok psikolojik olarak etkilemesi bu alanda gereksinim doğurmaktadır ve psikolojik olarak etkilenen bireylerin fiziksel ihtiyaçlarının da artması kaçınılmaz olarak görülebilir.

Lopez ve ark. (2019) jinekolojik kanserli kadınlarla yaptıkları çalışmada, genç hastaların cinsellik ihtiyacının daha fazla olduğunu söylemektedir (21). Çalışmamızda da destekleyici bakım gereksinimlerinde yaşın etkili olduğu, özelliklede 18-49 yaş grubu kadınlarda cinsellik ve hasta bakım ve desteği alanlarındaki gereksinimlerin fazla olduğu ve karşılanmadığı görülmüştür. Cinsellik alanı çalışmamızda karşılanmamış gereksinim gibi görünse de kanserin psikolojik ve fiziksel etkilerinden dolayı cinsellik katılımcılar için öncelikli alan ve ihtiyaç olarak görülmemiş olabilir ve bu düşünceyle anketi doldurmuş olabilirler. Bu konuda literatürde jinekolojik kanser hastalarının tedaviye başladıktan sonra çoğunun cinsel yaşamlarını sonlandırdıkları ve hastalığın ilerleyen dönemlerinde psikolojik sorunlar arttıkça cinsel aktivite düzeylerinin olumsuz yönde etkilendiği belirtilmektedir (16). Ayrıca çalışmamızda katılımcıların hasta bakım ve desteği alanındaki gereksinimlerinin karşılanmamasında olası engeller olarak; pandemi döneminde ve devamında yaşanan belirsizlikler, topluma yönelik alınan tedbirlerde spesifik grupları korumaya yönelik kısıtlama önlemleri, bu gruplara özgü rutin tedavilerini sürdürmeye yönelik düzenlemelerin yapılamaması ya da geç yapılması, tedbirlerin uygulanmasının (poliklinik hizmeti, ulaşım ve karantina sınırlamaları vb. gibi) özel grupların rutin tedavi sürecine ilişkin aksaklıklar oluşturması olabilir.

Hastaların eğitim düzeylerine göre üniversite mezunu olan hastaların cinsellik alt boyutu alanında daha fazla destekleyici bakıma gereksinimi olduğu bulunmuştur. Çelik (2021) araştırmasında hastaların eğitim seviyesi ile DBGÖ-KF, sağlık hizmeti ve bilgilendirme, günlük yaşam, psikolojik ve cinsellik ihtiyaçları arasında istatiksel olarak anlamlı farklılık bulunduğunu saptamıştır (22). Çalışmamızda eğitim düzeyi yüksek olan hastaların cinsellik alanında daha fazla gereksinim belirtmeleri; eğitim düzeyi arttıkça kişilerin gereksinimlerini daha iyi ifade edebilmeleri ve aynı zamanda eğitim düzeyi yüksek bireylerin farkındalıklarının yüksek olmasıyla ilişkilendirilebilir.

Kadınların çalışma durumlarına göre çalışmayan hastalarda fiziksel/günlük yaşam gereksinimlerinin fazla olduğu ve karşılanmadığı, çalışan hastaların da cinsellik gereksinimlerinin fazla olduğu ve karşılanmadığı tespit edilmiştir. Bu farklılığın çalışmamızdaki diğer bulgulara bakılarak çalışan kadınların eğitim seviyesinin yüksek, yaşının genç ve maddi durumunun eşit veya fazla olmasıyla ilişkilendirilebilir. Mesleki yaşantılarının hem hastalık hem de tedavi nedeniyle engellenmesi ya da işlerini kaybetmeleri bireylerin tedaviye uyumunu, yaşam kalitesini ve bakım gereksinimlerini etkilemektedir. Yıldırım ve ark. (2013)'ı hastaların işlerini yapamamalarının psikolojik gereksinimlerini arttırdığınıçalışmalarında belirtmişlerdir (4).

Yapılan çalışmalarda, ekonomik durumu daha düşük düzeyde olan hastaların, karşılanmayan ihtiyaçlarının ve bakım gereksinimlerinin daha yüksek olduğu (23), fiziksel/günlük yaşam, ruhsal/psikolojik, cinsel yaşam ve sağlık hizmeti ve bilgilendirme alanlarında bakım gereksinimlerindaha fazla olduğu saptanmıştır (16,22). Çalışmamızda gelir seviyesi düşük olan hastaların tedavi ve bakım mas-

raflarının, geçim sıkıntılarının ve aile üyelerinin mali zorlukları ile ilgili endişelerinin fiziksel/günlük yaşam ve ruhsal/psikolojik bakım gereksinimlerini etkilemiş olabileceği düşünülmektedir. Çalışmamızdan elde edilen sonuç, gelir düzeyi azaldıkça günlük yaşam için fiziksel ihtiyaçların arttığı ve psikolojik iyiliğin azaldığı söylenebilir.

Çalışmamıza dahil ettiğimiz hastaların %55,4'ünün over kanseri, %31,3'ünün endometrium kanseri, %10,3'ünün serviks kanseri, %1,5'inin vulva kanseri, %1,5'inin vajina kanseri olduğu belirlenmiştir. Tanılar arasında DBGÖ toplam puanı en yüksek olan kanser türü vulva/vajina kanseri olarak tespit edilmiştir. Vulva/vajina kanserlerinin destekleyici bakım gereksinimi endometrium ve over kanserine göre daha fazla olduğu görülmüştür. Fiziksel/günlük yaşam ve ruhsal/psikolojik alanlarında endometrium kanseri olanların over kanseri olanlara göre daha fazla gereksinim duydukları saptanmıştır. Cinsellik alanında serviks kanseri olan kadınların endometrium kanseri olan kadınlara göre daha fazla gereksinimi olduğu, vulva/vajina kanseri olan kadınların endometrium ve over kanseri olan kadınlara göre daha fazla destekleyici bakım gereksinimi olduğu tespit edilmiştir. Vulva/vajina kanseri kadının cinsel işlevselliğini önemli ölçüde etkileyen bir kanser türüdür aynı zamanda beden imajında meydana gelen değişim bu alanda destekleyici bakım gereksinimi doğurmaktadır.Günümüzde halen hastalar ve sağlık profesyonelleri arasında cinsellik hakkında yeterince konuşulamamakta ve bu hastalar genelde cinsel sorunlarını ikinci plana atabilmekte veya soru sormaktan çekindikleri; sağlık profesyonellerinin de bilgi eksikliği, utanma, yoğun iş temposu gibi sebeplerden yeterince zaman ayıramaması hastaların cinsel sorunlarına ilişkin problemlerinin çözülememesiyle ve bilgi eksiğiyle sonuçlanabilmektedir. Bu da beraberinde bilgilendirme alanında da gereksinim doğurmaktadır. Çalışmamızda da sağlık sistemi ve bilgilendirme alanında vulva/vajina kanseri olan kadınların over kanseri olan kadınlara göre daha fazla gereksinimi olduğu bulunmuştur. Lee ve Kwon'un (2018) over, serviks ve endometrium kanserli hastalarda yaptıkları çalışmada; over ve serviks kanseri olanların daha fazla karşılanmamış bakım gereksinimi olduğu bulunmuştur ve hastaların en yüksek psikolojik ihtiyaçlarının olduğu, bunu takiben emosyonel, fiziksel ve bilgi ihtiyaçlarının olduğu saptanmıştır (14). Yapılan bir tez çalışmasında over ve serviks kanseri olan hastaların daha fazla destekleyici bakım gereksinimi olduğu tespit edilmiştir (11). Afyanti ve arkadaşlarının jinekolojik kanserli kadınlarla yürüttükleri %65'i serviks kanseri olan çalışmada kadınların %96'sı destekleyici bakım gereksinimi olduğunu belirtmiş ve en yüksek gereksinim bildirilen alan fiziksel/günlük yaşam alanı olduğu bulunmuştur (2). Hediya Putri ve arakadaşlarının yaptıkları çalışmada 153 jinekolojik kanserli kadınların %64,7'sinin serviks kanseri, %35,3'ü over kanseri olarak bulunmuş olup kadınların en çok gereksinim belirtikleri alanın fiziksel/günlük yaşam alanı en az gereksinim belirttikleri alanın cinsellik alanı olduğu saptanmıştır (20). Fitch ve Steele'nin 2010 yılında Kanada'da over kanseri kadınların destekleyici bakım gereksinimlerini belirlemek amacıyla yaptıkları çalışmada, en sık bildirilen destekleyici bakım gereksiniminin ruhsal/psikolojik ve fiziksel/günlük yaşam alanlarında olduğunu tespit etmişlerdir (9).

Katılımcılarınhastalık evresine göre DBGÖ-KF ve alt boyutlarından aldıkları puanlar arasında istatistiksel olarak anlamlı farklılık olmadığı tespit edilmiştir. Fakat Evre IV hastaların ortalama puanının DBGÖ-KF toplamında, fiziksel/günlük yaşam, ruhsal/psikolojik ile Sağlık sistemi ve bilgilendirme alt boyutlarında daha yüksek olduğu gözlenmiştir. Çelik (2021) araştırmasında hastalık evresi ile DBGÖ-KF, sağlık hizmetleri ve bilgilendirme, fiziksel/günlük yaşam ve cinsellik alt boyutlarından elde edilen puanlar arasında istatistiksel olarak anlamlı fark tespit etmiştir. Evre IV'teki hastaların destekleyici bakım gereksinimlerinin diğer evrelere göre daha yüksek gereksinime ihtiyaçları olduğu saptanmıştır (22). Hastalığın ilerlemesine bağlı olarak uygulanan tedavilerin artması, farklı tedavi şekillerinin uygulanması ve bu tedavi türlerinin de yan etkilerinin fazla olmasına bağlı olarak hastaların bakım gereksinimlerinin arttığı düşünülebilir.

Çalışmamızda tedavi türlerine göre DBGÖ-KF toplam ve alt boyutlarından alınan puanlar arasındaanlamlı bir fark görülmemiştir ancak hem kemoterapi hem radyoterapi alan hastaların sadece kemoterapi alan hastalara göre cinsellik alanında daha fazla destekleyici bakım gereksinimi olduğu bulunmuştur. Bu sonuca benzer olarak Çelik'in (2021) çalışmasında cinsellik boyutunda sadece kemoterapi tedavisi alan hastaların, kemoterapi ve radyoterapi alanlardan ve cerrahi, radyoterapi ve kemoterapi alan hastalardan daha az gereksinim bildirmesi anlamlı bulunmuştur (22). Kullanılan tedavi yöntemleri arttıkça her tedavinin hasta üzerinde oluşturabileceği fiziksel, duygusal, psikolojik yan etkiler ve semptomlar nedeniyle hastaların gereksinimlerinin artması beklenen bir durumdur.

Çalışmamızda 5.kür kemoterapi alanların 6 kür üzeri kemoterapi alanlara göre destekleyici bakım gereksinimlerinin daha fazla olduğu saptanmıştır. Gelin'e (2015) göre, uygulanan kemoterapötik ilaçlara bağlı ağrı, bulantı-kusma, halsizlik, yorgunluk, mukozit, iştahsızlık gibi semptomlar gelişmekte ve bireyin yaşam kalitesini olumsuz yönde etkilemektedir. Bu semptomlar fiziksel gereksinimler, cinsellik gereksinimi, iletişim ve bilgi gereksinimi, psikososyal gereksinimler ve spiritüel gereksinimlerin ortaya çıkmasına yol açmaktadır. Bu gereksinimlerin karşılanma derecesi hastaların tedaviye uyumunu ve yaşam kalitesini etkilemektedir (24). Kemoterapi tedavisinin ikinci küründe şikayetler başlayıp üçüncü kürde pik yapabilmektedir. Kemoterapinin yan etkilerinin kür sayısı arttıkça şikayetlerin daha belirgin olarak hissedilmesi ve bu sürece uyum sağlayarak gereksinimlerini daha rahat ifade ediyor olabilme

olasılıkları çalışmamızdaki beşinci kürde olan hastaların bakım gereksinimlerinin daha fazla olması yönündeki sonuçları etkilemiş olabilir.

Yapılan çalışmalarda kanser evresinin artışıyla birlikte kanser hastalarının destekleyici bakım gereksinimlerinin arttığı saptanmıştır (22,25). Tedavisi zor olan ilerlemiş kanser hastaları çoğu zaman hem fiziksel hem de psikososyal sorunlar olmak üzere birçok zorlukla karşılaştıklarından ihtiyaçlarının yüksek olması ve bakım yükünün artması beklenen bir sonuçtur. Buna karşın çalışmamızda hastalık evresi bakım gereksinimlerini etkileyen bir faktör olarak saptanmadı. Bunun örneklem azlığından kaynaklandığı düşünülmektedir. Yine de hastalık evresinde artışın olmasıyla karşılanmamış gereksinimlerde artış olması sağlık çalışanları tarafından dikkate alınmalıdır.

SONUÇ

Destekleyici bakım uygulamaları, kanserin her aşamasında hasta ve ailesinin baş etmesine yardımcı olan bakımı ve hastanın hayat kalitesini yükseltmeye yönelik yapılan girişimleri içermektedir. Jinekolojik kanser hastalarının da fiziksel gereksinimler, tedaviye bağlı gelişen yan etkiler ile baş etme ile ilgili gereksinimler, bilgilendirme ve iletişim konusundaki gereksinimler, psikolojik ve ruhsal gereksinimler, sosyal gereksinimler, cinsellik gereksinimleri ve manevi gereksinimler gibi pek çok alanda destekleyici bakıma gereksinimleri vardır. Çalışmamızda jinekolojik kanser hastalarında en fazla psikolojik/ruhsal, sağlık sistemi ve bilgilendirme, fiziksel/günlük yaşam alanında destekleyici bakım gereksinimlerinin olduğu diğer bir deyişle karşılanmamış gereksinimlerinin olduğu ve bunu hasta bakım desteği ve bakım, cinsellik alanındaki karşılanmamış gereksinimlerin izlediği saptanmıştır. Hastaların yaş, eğitim düzeyi, çalışma durumu, maddi durum algısı, çocuk varlığı, çocuk sayısı,kanser tipi, kemoterapi kür sayısı ve tedavi türü gibi değişkenlerin destekleyici bakım gereksinimlerini etkilediği görülmüştür. Sağlık çalışanları tanı aşamasından itibaren kadınların ve onlara destek sağlayanların değer, inanç ve kültürel özelliklerine göre destekleyici bakım gereksinimlerini belirlemeli ve etkili bir şekilde yönetilmesini sağlamalı, yaşam kalitesini yükseltmek için gereksinimlere cevap verecek nitelikte girişimler planlanmalıdır.

KAYNAKLAR

1. Maguire R, Papadopoulou C, Kotronoulas G, Simpson MF, McPhelin J, Irvine L. Systematic review of supportive care needs of people living with lung cancer. Eur J Oncol Nurs 2013;17(4):449-64.
2. Afyanti Y, Milanti A, Putri RH. Supportive care needs in predicting the quality of life among gynecological cancer patients. Can Oncol Nurs J 2018; 28(1):22-9.
3. Harrison JD, Young, JM, Price MA, Butow, PN, Solomon MJ. What are the unmet supportive care needs of people with cancer? A systematic review. Support Care Cancer 2009;17(8):1117–28.
4. Yıldırım NK, Kaçmaz N, Özkan M. Yetişkin kanser hastalarının destekleyici bakım gereksinimleri ve verilen hizmet arasındaki boşluk. DEUHYO ED 2013;6(4): 231-40.
5. Gümüş BA. Meme kanserinde psikososyal sorunlar ve destekleyici girişimler. Meme Sağlığı Dergisi, 2006;2(3):108-114.
6. Patterson P, Millar B, Desille N, Mc Donald F. The unmet needs of emerging adults with a cancer diagnosis: a qualitative study. Cancer Nurs, 2012;35(3):32-40.
7. Beesley V, Janda M, Eakin E, Obermair A, Battistutta D. Lymphedema after gynecological cancer treatment. Journal of Cancer 2007;109(12): 2607–14.
8. Steele R, Fitch MI. Supportive care needs of women with gynecologic cancer. Cancer Nurs. 2008;31(4): 284-91.
9. Fitch MI, Steele R. Identifying supportive care needs of women with ovarian cancer. Can Oncol Nurs J 2010; 20(2): 66–74.
10. Urbaniec OA, Clin M, Collins K, Clin M. Gynecological cancer survivors : assessment of psychological distress and unmet supportive care needs. J Psychosoc Oncol 2011; (3):37–41.
11. Var E. Jinekolojik kanserli hastaların destekleyici bakım gereksinimlerinin belirlemesi. (Tez). Adana: Çukurova Üniversitesi, 2019.
12. Özçelik H, Fadıloğlu Ç, Uyar M, Karabulut B. Editörler. Kanser hastaları ve aileleri için palyatif bakım. 1. Baskı. İzmir: Üniversiteliler Ofset, 2010.
13. Kurşun Ş, Kanan N. Validity and reliability study of the Turkish version of Caring Behaviors İnventory-24. Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi 2012; 15(4): 229-35.
14. Lee HJ, Kwon IG. Supportive care needs of patients with gynecologic cancer, Asian Oncol Nurs 2018;18(1):21-9.
15. Boyes A, Girgis A, Lecathelinais C. Brief assessment of adult cancer patients' perceived needs: development and validation of the 34-item Supportive Care Needs Survey (SCNS-SF34). J Eval Clin Pract 2009; 15(4):602-6.
16. Aksuoğlu A, Şentürk L. Kanser hastaları için destekleyici bakım gereksinimleri ölçeği'nin Türk toplumunda geçerlilik ve güvenirliğinin incelenmesi. Türkiye Klinikleri J. Med. Sci 2016;36(3):121-29.
17. Williams N, Griffin G, Farrell V, Rae A, Murray K, Hauck YL. The Supportive care needs of women experiencing gynecologic cancer: A Western Australian cross-sectional study. BMC Cancer 2018;(18)1: 912.
18. Tsatsou I, Konstantinidis T, Kalemikerakis I, Adamakidou T, Vlachou E, Govina O. Unmet supportive care needs of patients with hematological malignancies: A systematic review. Asia Pac J Oncol Nurs 2021;15;8(1):5-17.
19. Temiz G, Durna Z. Evaluation of quality of life and health care needs in cancer patients receiving chemotherapy. J Cancer Educ. 2020;35(4):796-807.
20. Hediya Putri R, Afiyanti Y, Ungsianik T, Milanti A. Supportive care needs and quality of life of patients with gynecological cancer undergoing therapy. Enfermería Clínica 2018; 28: 222–6.
21. Lopez AJ, Butow PN, Philp S, Hobbs K, Phillips E, Robertson R, et al. Age-related supportive care needs of women with gynaecological cancer: A qualitative exploration. Eur J Cancer Care 2019:28(4):e13070.
22. Çelik H. Kanser hastalarının destekleyici bakım gereksinimleri ile tamamlayıcı ve alternatif tıbba karşı tutumları arasındaki ilişkinin incelenmesi. (Tez). Malatya: İnönü Üniversitesi, 2021.
23. Tabriz RT, Yekta ZP, Shirdelzade S, Saadati M, Orooji A, Shahsavari H, et al. Unmet needs in Iranian cancer patients. Med J Islam Repub Iran 2017;31:35.
24. Gelin D, Ulus B. Hastanede kemoterapi alan hastaların yaşam kalitesi ve bunu etkileyen faktörler. ACU Sağlık Bil Derg 2015;6(1):31-5.
25. Okediji T, Salako O, Fatiregun O. Pattern and predictors of unmet supportive care needs in cancer patients. Cureus 2017; 9(5):12-34.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Yenidoğan yoğun bakım ünitesine geçişte bir ara basamak: doğum salonunda kurulan yenidoğan ünitesinin term ve terme yakın yenidoğanlarda solunum sıkıntısı nedenli hastane yatışları üzerindeki etkisinin değerlendirilmesi

An intermediate step in transition to the neonatal intensive care unit: assessment of the impact of the intermediate neonatal care unit constructed in the delivery room on hospitalizations due to respiratory distress in term and late preterm neonates

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ÖZ

Amaç: Term ve terme yakın yenidoğanlarda doğum sonrası geçiş gecikmesine bağlı olarakgelişen solunum sıkıntısı, yenidoğan yoğun bakım ünitesi (YYBÜ) yatışlarının önemli bir nedenidir. Çalışmamızda ara basamak yapılanmanın, yenidoğanın geçici takipnesi (YGT) ve geçiş gecikmesi nedeniyle YYBÜ yatış ve pnömotoraks oranına etkisinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Hastanemiz doğum salonu içerisinde 1 Nisan 2021'de YYBÜ'ne kısa süreli yatışları azaltabilmek amacıyla, 4 yataklı ara basamak bir yenidoğan ünitesi kurulmuştur. Ünitede iki yenidoğan hemşiresi ve kıdemli iki pediatri asistanı görev almaktadır. ILCOR 2021 kılavuzu doğrultusunda solunum sıkıntısı nedeniyle nazal sürekli pozitif havayolu basıncı (nCPAP) ihtiyacı olan ≥34 haftada doğanyenidoğanlar, ara basamak kurulumu öncesi (Ocak 2020-Mart 2021=Dönem 1) ve sonrası (Nisan 2021-Aralık 2022=Dönem 2) olmak üzere iki dönemde perinatal, postnatal ve YYBÜ yatış özellikleri açısından retrospektif olarak değerlendirildi.

Bulgular: Dönem 1 ve Dönem 2'deki bebeklerin demografik özellikleri benzerdi (p>0.05). Dönem 1'de YYBÜ'nde nCPAP uygulanan bebeklerin %89'unda en az bir solunum sıkıntısı belirtisi mevcutken, Dönem 2'de 10. dakikadan sonra O2 satürasyon hedeflerine ulaşamadığı için daha erken nCPAP uygulanması nedeniyle, nCPAP uygulanan bebeklerin oranında artış, buna karşın hastane yatış oranlarında anlamlı azalma olduğu görüldü (p<0.01). Dönem 2'de YYBÜ'ne yatırılan hastalarda entübasyon gereksinimi daha fazla (p=0.01), toplam mekanik ventilasyon süresi daha uzundu (p=0.035). Her iki dönemde hastane yatış süreleri ve pnömotoraks oranları benzerdi (p=0.489 ve p=0.720).

Sonuç: Doğum salonunda yapılandırılan ara basamak bir yenidoğan ünitesinin sağlanan nCPAP tedavisi ile hava kaçağına yol açmadan term ve terme yakın yenidoğanların YYBÜ yatışlarının azalmasını sağladığı gösterilmiş olup; YYBÜ kaynaklarının akılcı kullanımının, yatış ile anne ve bebeğin ayrılmasını ve ailede oluşacak kaygıyı azaltacağı öngörülmektedir.

Anahtar Kelimeler: Doğum salonu, geç preterm, geçiş gecikmesi, nazal CPAP, yenidoğanın geçici takipnesi

ABSTRACT

Aim: Respiratory distress due to transition delay in term and late preterm newborns is an important cause of neonatal intensive care unit (NICU) admissions. In our study, we aimed to assess the impact of the intermediate neonatal care unit structure on the occurrence of NICU admission and pneumothorax resulting from transient tachypnea of neonate (TTN) and transition delay.

Materiasl and Methods: On April 1, 2021, an intermediate neonatal care unit with 4 beds was established in the delivery room of our hospital in order to reduce short-term hospitalizations in the NICU. The unit is staffed by two senior pediatric residents and two neonatal nurses. In accordance with the ILCOR 2020 recommendations, newborns born ≥ 34 weeks who require nasal continuous positive airway pressure (nCPAP) due to respiratory distress, before (January 2020–March 2021=Period 1) and after (April 2021–December 2022=Period 2) the intermediate care unit were evaluated retrospectively in terms of perinatal, postnatal and NICU hospitalization characteristics.

Results: Demographic characteristics of infants in Period 1 and Period 2 were similar (p>0.05). At least one symptom of respiratory distress was observed in 89% of neonates receiving nCPAP in the NICU throughout period 1. In period 2, there was an increase in the number of infants who received nCPAP because O2 saturation targets could not be reached after the 10th minute. Hospitalization rates declined significantly in the Period 2 (p<0.01). Invasive mechanical ventilation requirement was higher (p=0.01) and total ventilation time was longer (p=0.035) in patients hospitalized in the NICU in period 2. Duration of hospital stay and pneumothorax rates were similar in both periods (p=0.489 and p=0.720).

Conclusion: It has been shown that an intermediate neonatal care unit structured in the delivery room provides a reduction in NICU hospitalizations of term and late preterm newborns without causing air leakage with the nCPAP treatment. The appropriate use of resources is expected to minimize the anxiety that will arise in the family and the separation of mother and infant during hospitalization.

Keywords: delivery room, late preterm, nasal continuous positive airway pressure, transitional delay, transient tachypnea of the neonate

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GİRİŞ VE AMAÇ

Yenidoğanın geçici takipnesi (YGT), intrauterin ortamda sıvı ile dolu olan fetal akciğer sıvısının yetersiz klirensine bağlı olarak fetal-neonatal kardiyopulmoner geçişin gecikmesi sonucunda ortaya çıkmaktadır (1, 2). Doğum sonrasında ağlama ve alınan ilk soluklar ile fonksiyonel rezidüel kapasite (FRK) oluşturularak yeterli akciğer hacmi sağlanmaktadır. Bu geçiş dönemiher bebek değişmekle birlikte yaklaşık altı saat sürmektedir.

Uluslararası Resüsitasyon Komitesi'nin (ILCOR) 2010 yılında yayınladığı neonatal resüsitasyon programı güncellemesinden itibaren, doğum salonunda solunum sıkıntısı yaşayan, persistan siyanozu olan ve serbest akış oksijen ile solunum sıkıntısı bulguları gerilemeyen bebeklere nazal sürekli pozitif havayolu basıncı (nCPAP) uygulaması önerilmektedir.Bu öneri 2020 yılındaki güncelleme de yerini korumaktadır (3, 4).

Term ve terme yakın yenidoğanlarda postnatal erken dönemde ortaya çıkan solunum sıkıntılarının %40'ını YGT oluşturmaktadır ve yenidoğan yoğun bakım ünitesi (YYBÜ) yatışlarının önemli bir bölümünü oluşturmaktadır (5, 6). Bu yatışlar sıklıkla kısa süreli olsa da bebek ile annenin ayrılmasına neden olmakta, anne sütü ile beslenmeye geçişte gecikmelere sebep olmakta, sağlık bakımı ilişkili komplikasyonlara yol açmakta, malzeme ve iş gücü kullanımına sebep olmaktadır.

Çalışmamızda, doğum salonundan yenidoğan yoğun bakıma geçişte bir ara basamak yapılanmanın, YGT ve geçiş gecikmesi nedeniyle YYBÜyatış ve pnömotoraks üzerine etkisinin değerlendirilmesi amaçlanmıştır.

GEREÇLER VE YÖNTEM

Hastanemiz doğum salonu içerisinde 1 Nisan 2021'de YYBÜ'ne kısa süreli yatışları azaltabilmek amacıyla, dört yataklı ara basamak bir yenidoğan ünitesi kurulmuştur. Ünitede iki yenidoğan hemşiresi ve kıdemli iki pediatri asistanı görev almaktadır.

ILCOR 2020 kılavuzu doğrultusunda solunum sıkıntısı nedeniyle nCPAP ihtiyacı olan ≥34 haftada doğanyenidoğanlara bu ara basamakta solunum destek tedavisi uygulanmakta ve izlemleri yapılmaktadır. nCPAP uygulaması, değişken akımlı CPAP cihazı (Infant Flow Driver, Viasys, Carefusion, USA) ile kısa binazal prong aracılığı ile yapılmaktadır. Başlangıç ekspiryum sonu basınç değeri (PEEP) 5-6 cm H_2O ve oksijen satürasyonu (SpO_2) %90-95 aralığı hedeflenerek ihtiyaca göre FiO_2 değeri ayarlanmaktadır. Yenidoğanların solunum sıkıntısı bulguları hemşire ve doktor ekibi tarafından gözlenmekte olup nabız oksimetre ileSpO_2 izlemi yapılmaktadır. Tüm hastalarda noninvaziv solunum desteği başlanırken orogastrik sonda yerleştirilerek gastrik dekompresyon sağlanmaktadır. Solunum sayısı <60/dk, steteskopla veya dışardan inleme duyulmaması, subkostal ve interkostal retraksiyonların olmaması ve FiO_2 <%30 olduğunda hastalar solunum desteğinden ayrılmaktadır. Solunum desteğinden ayrılan hastalar ihtiyacına göre oda havasında veya serbest akış oksijen ile izlenmektedir. İzlemin sonunda solunum desteğinden ayrılan olgular anne yanına verilmekte ve izlemi orada sürdürülmektedir. Solunum desteğinden ayrılamayan veya izlemi sırasında solunum yetmezliği bulguları gelişen yenidoğanlar ise tedavinin devamı için YYBÜ'ne yatırılmaktadır. Dönem 1'de 4 saatten, Dönem 2'de ise 8 saatten uzun süre CPAP ihtiyacı devam eden bebekler YYBÜ'ne yatırılmıştır.

Çalışmada, doğumdan hemen sonra solunum destek tedavisi verilen yenidoğanların ara basamak kurulumu öncesi ve sonrası olarak iki ayrı dönemde perinatal, postnatal ve YYBÜ yatış özellikleri retrospektif olarak değerlendirilmiştir. Ocak 2020-Mart 2021 arasında doğan bebekler Dönem 1, Nisan 2021-Aralık 2022 arasında doğan bebekler ise Dönem 2 olarak iki gruba ayrılmıştır. Her iki gruba da gebelik haftası ≥34 haftaDA> 2000 gr olan, spontan solunumu olan, doğum sonrasında pozitif basınçlı ventilasyon (PBV) dışında ileri canlandırma ihtiyacı olmayan ve doğum sonrasında ilk 30 dakikalık geçiş izlemi sonrasında, postnatal ilk 2 saati içindesolunum sıkıntısı bulguları (takipne, retraksiyon, inleme, siyanoz) saptanarak nCPAP endikasyonu konulan yenidoğanlar dahil edilmiştir. Antenatal tanılı konjenital malformasyonu olan veya antenatal tanısı olmadan doğum sonrası ilk değerlendirmesinde kuvvetle konjenital malformasyon düşündüren fizik inceleme bulguları olan (havayolu malformasyonu, kromozom anomalileri, intestinal atrezi, iskelet displazisi, nöral tüp defekti gibi), yetersiz spontan solunumu olan, ileri düzey canlandırmadan geçen, solunum yetmezliği bulguları olan ve mutlak yenidoğan yoğun bakım yatış endikasyonu olan yenidoğanlar çalışmadan dışlanmıştır.

Tüm olguların gebelik haftası, doğum ağırlığı, cinsiyet, doğum şekli, annede hastalık öyküsü, APGAR skorları, solunum sıkıntısı bulguları (takipne, retraksiyon, inleme, satürasyon hedefine ulaşamama), nCPAP süresi; yenidoğan yoğun bakım yatışı gereken olguların tanısal özellikleri, non-invaziv ve invaziv solunum desteği süreleri, hastane yatış süreleri ve pnömotoraks gelişimi dosya verilerinden geriye dönük olarak kaydedilmiştir.

Verilerin analizi SPSS for Windows version 11.5 yazılımı (SPSS Inc., Chicago, IL, US) kullanılarak gerçekleştirilmiştir. Nicel değişkenler için tanımlayıcı olarak ortalama ± standart sapma ve medyan (minimum-maksimum) ve nitel değişkenler için hasta sayısı (yüzde) kullanılmıştır. Normal dağılmayan veriler için nicel bir değişkenle ilgili olarak iki kategorili nitel bir değişkenin kategorileri arasındaki

istatistiksel olarak anlamlı farklılıkları analiz etmek için Mann Whitney U testi yapılmıştır. İki kategorik değişken arasındaki ilişkiyi analiz etmek için ki-kare ve Fisher exact testleri kullanılmıştır. İstatistiksel anlamlılık düzeyi p<0.05 olarak alınmıştır.Çalışma için etik kurul onayı, Ankara Üniversitesi Tıp Fakültesi İnsan Araştırmaları Etik Kurulu tarafından verilmiştir (Karar no: İ03-140-23).

BULGULAR

Çalışmaya dahil edilen 604 yenidoğanın 152'si (%25,1) Dönem 1, 452'si (%74,1) Dönem 2 grubunda yer almaktaydı. Her iki grupta yer alan olguların gebelik haftası, doğum ağırlığı, cinsiyet ve doğum şekli benzerdi (Tablo 1). Dönem 1 grubunda yer alan hastaların annelerinde gestasyonel diyabet sıklığı daha fazla iken (sırasıyla %18,4 ve %9,1, p=0,002) gebeliğin hipertansif bozuklukları ile hipotiroidi sıklıklarıiki grup arasında benzerdi. Çalışmada yer alan yenidoğanların perinatal ve postnatal özellikleri Tablo 1'de gösterilmektedir.

Her iki grupta yenidoğanların 1. ve 5. dakika Apgar skorları ile PBV gereksinimleri arasında anlamlı farklılık saptanmadı (p>0,05) (Tablo 1). Dönem 1'de ara basamak yenidoğan ünitesinde nCPAP uygulanan bebeklerde takipne ve inleme bulgularının saptanma oranları benzerdi. Retraksiyon veya burun kanadı solunumu saptanarak nCPAP gereksinimine karar verilen bebeklerin oranı,

Tablo 1. Yenidoğanların perinatal ve postnatal özellikleri

	Dönem 1 (n= 152)	Dönem 2 (n=452)	P
Perinatal Özellikler			
Gebelik haftası (hft)[a]	37,8 (±1,77)	38,0 (±1,6)	0,468
Doğum ağırlığı (g)[a]	3201 (±546)	3213 (±554)	0,726
Cinsiyet (erkek)[b]	89 (58,6)	232 (51,3)	0,123
Doğum şekli (C/S)[b]	125 (82,2)	352 (77,9)	0,254
Gestasyonel diyabet[b]	28 (18,4)	41 (9,1)	0,002
Gebeliğin hipertansif bozuklukları[b]	2 (1,3)	16 (3,5)	0,163
Annede hipotiroidi[b]	12 (7,9)	60 (13,3)	0,077
Postnatal Özellikler			
APGAR 1. dk[c]	8 (1-9)	8 (1-9)	0,225
APGAR 5. dk[c]	9 (5-10)	9 (5-10)	0,069
PBV ihtiyacı[b]	17 (11,2)	40 (8,8)	0,394
Gebelik yaşına göre doğum ağırlığı[b] SGA AGA LGA	 5 (3,3) 121 (76,9) 26 (17,1)	 17 (3,8) 357 (79) 78 (17,3)	0,962
Doğum Salonunda Solunum Sıkıntısı Bulguları			
Takipne[b]	48 (31,6)	105 (23,2)	0,107
Retraksiyon/burun kanadı[b]	106 (69,7)	234 (51,8)	<0,001
İnleme[b]	74 (48,7)	183 (40,5)	0,077
Satürasyon hedefine ulaşamama[b]	82 (53,9)	294 (65)	0,015
Takipne, retraksiyon, inleme bulgularından en az birinin varlığı[b]	136 (89,5)	348 (77)	0,001
Takipne, retraksiyon, inleme bulgularından en az birine ek olarak satürasyon hedefine ulaşamama[b]	66 (43,4)	190 (42)	0,765
nCPAP süresi (dk)[a]	83,60 (±54,02)	77,33 (±56,55)	0,217
Yenidoğan Yoğun Bakıma Yatış Oranları ve Tanısal Özellikler			
Yenidoğan yoğun bakım yatışı[b]	73 (48)	136 (30)	<0,001
Geçiş gecikmesi ve YGT'lerde yatış	61 (43,6)	104 (24,8)	<0,001

[a] Mann Whitney U testi, ortalama± standart sapma
[b] Ki-kare testi, n(%)
[c] Mann Whitney U testi, ortanca (min-max)
AGA: gebelik yaşına göre normal doğum ağırlıklı nCPAP: nazal sürekli pozitif havayolu basıncı LGA: gebelik yaşına göre büyük doğum ağırlıklı PBV: pozitif basınçlı ventilasyon
SGA: gebelik yaşına göre düşük doğum ağırlıklı YGT: yenidoğanın geçici takipnesi

Tablo 2. Yenidoğan yoğun bakıma yatış gereksinimi olan yenidoğanların özellikleri

	Dönem 1 (n= 73)	Dönem 2 (n=136)	P
Non invaziv solunum desteği süresi (sa)[c]	7,92 (0-192)	18 (0-120)	0,061
İnvaziv solunum desteği süresi (sa)[c]	7,92 (0-312)	18 (0-360)	0,035
Toplam oksijen desteği süresi (sa)[c]	24 (1-324)	24 (1-367)	0,280
Yatışta entübasyon gereksinimi[b]	2 (2,7)	18 (13,2)	0,014
Entübasyon süresi[c]	96 (72-120)	72 (12-240)	0,568
Hastanede yatış süresi (gün)[a]	4,29 (±3,30)	4,85 (±4,28)	0,489
Pnömotoraks[b]	2 (2,7)	5 (3,7)	0,720
Taburculuk tanıları[b] Erken neonatal sepsis- konjenital pnömoni	12 (16,4)	31 (23)	0,267

[a] Mann Whitney U testi, ortalama± standart sapma
[b] Ki-kare testi, n(%)
[c] Mann Whitney U testi, ortanca (min-max)

Dönem 1'de %69,7 iken Dönem 2'de %51,8'di (p<0,001). Doğum sonrası 10. dakikada SpO_2 hedefine ulaşamadığı için nCPAP uygulanan bebeklerin oranı Dönem 1'de %53,9 iken Dönem 2'de %65'ti (p=0,015). Dönem 1'deki yenidoğanların %89,5'inde en az bir solunum sıkıntısı belirtisi mevcutken, Dönem 2'de bu oran %77 olarak saptandı (p=0,001) Dönem 2'de 10. dakikadan sonra SpO_2 hedeflerine ulaşamadığı için daha erken nCPAP uygulanan bebeklerin oranında artış olduğu gözlendi. Her iki grupta ortalama nCPAP süreleri benzerdi (p>0,05).

Dönem 1'de nCPAP uygulanan hastalardan 73'ünde (%48) YYBÜ yatış gereksinimi olurken, Dönem 2'dekilerin 136'sı (%30) YYBÜ'ye yatırılmıştı (p<0,001). Tüm bebeklerin anne yanından veya YYBÜ'den taburculukta son tanıları değerlendirildiğinde, Dönem 1'de geçiş gecikmesi ve YGT tanısı alan tüm hastaların içinde YYBÜ yatış oranı %43,6 iken, Dönem 2'de bu oranın %24,8'e gerilediği görülmüştür (p<0,001).

YYBÜ'ye yatan yenidoğanların özellikleri Tablo 2'de verilmiştir. Dönem 1 ve Dönem 2'de yer alan bebeklerin non-invaziv solunum desteği ve toplam oksijen desteği süreleri benzer iken, Dönem 2'de invaziv solunum destek süresi ortancası daha uzundu (p=0,035). Yatan hastalarda entübasyon gereksinimi olanların oranı Dönem 2'de %18 iken Dönem 1'de %2,7 idi (p=0,014). Entübe edilen hastaların entübasyon süresi ortancaları benzerdi. Her iki grupta pnömotoraks oranları, taburculuk tanıları ve hastane yatış süreleri benzer bulundu (p>0,05).

TARTIŞMA

Term ve geç prematüre bebeklerde solunum sıkıntısı, YYBÜ yatışlarının önemli bir kısmını oluşturmaktadır. Bu çalışmada, solunum sıkıntısı nedenli YYBÜ yatışlarının önlenebilmesi için kurulan bir ara basamak ünitenin yatış oranlarını azalttığı saptanmıştır.

Geçiş gecikmesi ve YGT tedavisinde nCPAP uygulamasının etkinliğini değerlendiren çalışmalar bulunmaktadır. Chiruvolu ve ark., çalışmalarında YGT tedavisinde nCPAP ve nazal kanül ile düşük akımlı oksijen tedavisi alan bebeklerde solunum destek tedavi süresi ve hastane yatış süresinin benzer olduğunu ancak, nCPAP ile tedavi verilen grupta ek oksijen süresinin daha kısa olduğunu saptamışlardır (7). Cochrane metaanalizinde nCPAP uygulamasının serbest akış oksijen uygulamasına göre invaziv solunum desteği gereksinimini azaltmadığı, ancak tedavi süresini kısalttığı raporlanmıştır (8). Bu çalışmalarda, nCPAP uygulamasının yararlarına rağmen pnömotoraks sıklığını artırmasından endişe duyulmuştur ancak nCPAP uygulaması ve oksijen uygulaması arasında pnömotoraks sıklıkları benzer bulunmuştur (7, 8). Çalışmamıza dahil edilen tüm bebeklere nCPAP uygulanmıştır, ancak çalışma verilerimize bakılarak nCPAP uygulamasının pnömotoraks sıklığı üzerine etkisi ile ilgili yorum yapılamasa da bu sıklıkların literatürde bildirilen yenidoğanlardaki spontan pnömotoraks oranlarıyla benzer olduğu söylenebilir (9). Smithhart ve ark., yeni resüsitasyon programı güncellemesinden sonra doğum salonunda nCPAP uygulamasının pnömotoraks gelişimi üzerindeki etkisini inceleyen büyük örneklemli bir çalışma gerçekleştirmişlerdir. Bu çalışmada nCPAP uygulamasının pnömotoraks riskini arttırdığı, ancak bu risk artışının serbest oksijen uygulanmadan nCPAP'a alınan bebeklerde daha fazla olduğunu göstermişlerdir. Ancak bu çalışmada sadece semptomatik bebeklere akciğer grafisi çekildiği için, asemptomatik bebeklerdeki pnömotoraks oranı bilinmemekte; ayrıca nCPAP uygulamasından önce akciğer grafisi çekilmediği için pnömotoraksın sadece nCPAP uygulaması ile ilişkili olduğu söylenememektedir (10). Çalışmamızda da, buna benzer şekilde

sadece solunum sıkıntısı bulguları gerilemeyen hastalarda YYBÜ yatışı sonrasında akciğer grafisi çekildiği için gerçek pnömotoraks sıklığı bilinememektedir.

ILCOR neonatal resüsitasyon kılavuzlarında, doğum salonunda solunum sıkıntısının yönetiminde nCPAP uygulamasının önerilmesinden sonra, doğum salonunda nCPAP kullanımı ile ilgili araştırmalar yapılmıştır. Hishikawa ve ark.nın retrospektif çalışmasında,2010 ILCOR neonatal resüsitasyon kılavuzu güncellemesinden önce ve sonra doğum salonunda maske ile nCPAP uygulamasının sonuçlarıdeğerlendirilmiş, doğum salonu nCPAP uygulamasından sonra, doğum salonunda oksijen desteği verilme oranında azalma ve nCPAP uygulama oranında artış saptanmıştır. Ancak bu çalışmada yaşamın ilk 24 saatinde solunum destek tedavisi için YYBÜ'ne yatırılan bebek oranında artış gözlenmiştir. Yazarlar bu artışın, yüz maskesi ile nCPAP uygulamasının ölü boşluğu artırması ve buna ikincil olarak artan solunum iş yükü ile ilişkili olabileceğini öne sürmüşlerdir (11). Celebi ve ark., elektif sezaryen ile doğan bebeklerde profilaktik CPAP uygulamasının YYBÜ yatışlarını azalttığını saptamışlardır (12). Çalışmamızda, Dönem 2'de ara basamak yenidoğan ünitesinin kurulmasından sonra solunum sıkıntısı bulguları olmaksızın sadece 10. dakikada SpO_2 hedeflerine ulaşılamama nedeniyle nCPAP desteği verilen bebeklerin sıklığında artış saptanmıştır. Bu sonuç, Dönem 2'de nCPAP endikasyonu eşiğinin daha düşük olduğunu ve önceki yıllara göre daha fazla nCPAP uygulandığını düşündürmektedir. Buna rağmen Dönem 2'de pnömotoraks riskinde artışa yol açmadan YYBÜ yatış oranları anlamlı olarak azalmıştır.

Tüm hasta grubunun taburculuk öncesi tanıları değerlendirildiğinde Dönem 1'de geçiş gecikmesi ve YGT tanılı hastalarda YYBÜ yatış oranı %43,6 iken bu oran Dönem 2'de %24,8'e gerilemiştir. Yatan hastalarda erken neonatal sepsis/ konjenital pnömoni tanılı hastaların oranı Dönem 2'de daha fazla bulunmuştur ancak sonuç istatistiksel olarak anlamlı değildir. Toplam invaziv solunum desteği süresi Dönem 2'de daha uzun ve entübasyon gereksinimi oranı Dönem 2'de daha fazladır. İnvaziv solunum desteği süresinin ve entübasyon gereksiniminin Dönem 2'de daha yüksek olması, Dönem 2'de geçiş gecikmesi ve YGT tanılı hastaların yatış oranının daha az olmasına ve Dönem 2'de erken neonatal sepsis/ konjenital pnömoni tanılı hastaların oranının daha yüksek olması ile ilişkilendirilebilir. Bu bulgular, ara basamak yenidoğan ünitesi uygulamasının,hedef hasta grubu olan geçiş gecikmesi ve YGT tanılı hastalar üzerinde kısa süreli YYBÜ yatışlarınıönleyebildiğine ilişkin bir sonuç olarak değerlendirilmiştir.

Bu çalışma, doğum salonunda yapılandırılan YYBÜ'ne geçiş öncesi bir ara basamak ünitenin solunum sıkıntısı nedenli hastane yatışları üzerindeki etkisini değerlendiren az sayıdaki çalışmadan biridir. Retrospektif kurgusu ve nCPAP endikasyonlarının laboratuvar incelemeleri veya klinik skorlamalar gibi objektif kriterler yerine klinisyen değerlendirmesine göre belirlenmesi çalışmanın en önemli kısıtlılıklarıdır.

Bu çalışma ile ara basamak bir yenidoğan ünitesinde sağlanan nCPAP tedavisinin hava kaçağına yol açmadan term ve geç preterm yenidoğanların YYBÜ yatışlarının azalmasını sağladığı gösterilmiştir. YGT gibi durumların azımsanamayacak bir bölümü, YYBÜ olmayan, solunum destek tedavilerinin verilemediği birinci basamak hastanelerde görülmektedir ve bebeklerin üst basamak hastanelere sevk edilmesi gerekmektedir. Ara basamak bir ünitenin yapılandırılmasının, hastane yatışlarını ve yenidoğan sevklerini azaltarak, anne-bebek birlikteliğini sağlayacağı, ailede oluşacak kaygıyı gidereceği öngörülmektedir.

KAYNAKLAR

1. Bland RD. Lung fluid balance during development. NeoReviews. 2005;6(6):255-67.
2. Pramanik AK, Rangaswamy N, Gates T. Neonatal respiratory distress: a practical approach to its diagnosis and management. Pediatr Clin North Am. 2015;62(2):453-69.
3. Aziz K, Lee HC, Escobedo MB, Hoover AV, Kamath-Rayne BD, Kapadia VS, et al. Part 5: Neonatal Resuscitation: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2020;142(16_suppl_2):S524-S50.
4. Perlman JM, Wyllie J, Kattwinkel J, Atkins DL, Chameides L, Goldsmith JP, et al. Neonatal resuscitation: 2010 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. Pediatrics. 2010;126(5):e1319-e44.
5. Raju TN, Higgins RD, Stark AR, Leveno KJ. Optimizing care and outcome for late-preterm (near-term) infants: a summary of the workshop sponsored by the National Institute of Child Health and Human Development. Pediatrics. 2006;118(3):1207-14.
6. Kumar A, Bhat BV. Epidemiology of respiratory distress of newborns. Indian J Pediatr. 1996;63(1):93-8.
7. Chiruvolu A, Claunch KM, Garcia AJ, Petrey B, Hammonds K, Mallett LH. Effect of continuous positive airway pressure versus nasal cannula on late preterm and term infants with transient tachypnea of the newborn. J Perinatol. 2021;41(7):1675-80.
8. Moresco L, Romantsik O, Calevo MG, Bruschettini M. Non-invasive respiratory support for the management of transient tachypnea of the newborn. Cochrane Database Syst Rev. 2020;4(4):CD013231.
9. Davis CH, Stevens G. Value of routine radiographic examinations of the newborn, based on a study of 702 consecutive babies. American Journal of Obstetrics and Gynecology. 1930;20(1):73-6.
10. Smithhart W, Wyckoff MH, Kapadia V, Jaleel M, Kakkilaya V, Brown LS, et al. Delivery Room Continuous Positive Airway Pressure and Pneumothorax. Pediatrics. 2019;144(3).
11. Hishikawa K, Fujinaga H, Fujiwara T, Goishi K, Kaneshige M, Sago H, et al. Respiratory Stabilization after Delivery in Term Infants after the Update of the Japan Resuscitation Council Guidelines in 2010. Neonatology. 2016;110(1):1-7.
12. Celebi MY, Alan S, Kahvecioglu D, Cakir U, Yildiz D, Erdeve O, et al. Impact of Prophylactic Continuous Positive Airway Pressure on Transient Tachypnea of the Newborn and Neonatal Intensive Care Admission in Newborns Delivered by Elective Cesarean Section. Am J Perinatol. 2016;33(1):99-106.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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The predictive value of preoperative inflammatory markers / lymphocyte ratios for endometrial cancer; what does the eosinophil to lymphocyte ratio means for survival?

Endometrial kanser tahmininde peoperatif inflamatuar belirteçlerin lenfosite oranının önemi; eozinofil'in lenfosit oranı sağkalım için ne anlama geliyor?

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ABSTRACT

Aim: In various solid tumors, cancer-associated inflammation is associated with adverse long-term outcomes. The purpose of this study was to examine the influence of the preoperative neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR) and other systemic inflammatory markers on lymph node metastasis and 5-year survival in endometrial cancer.

Materials and Methods: A total of 379 female patients at the Gynecology and Obstetrics Clinic of the University Hospital with a final postoperative pathology of endometrial cancer were included in the 5-year survival study. The preoperative total neutrophil, monocyte, eosinophil, and platelet counts were divided by the lymphocyte count to obtain the NLR, monocyte-to-lymphocyte ratio (MLR), eosinophil-to-lymphocyte ratio (ELR), and PLR values. All patients underwent bilateral pelvic paraaortic lymph node dissection and omentectomy in addition to total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAH + BSO). The pathology lab at our university evaluated all cytology and postoperative specimens. The staging system used was the FIGO 2009 surgical staging system.

Results: The results of our study showed significant correlations between lymph node metastasis and NLR, eosinophil-to-lymphocyte ratio (ELR), and PLR. Only a significant correlation between ELR and survival was discovered when the relationship with 5-year survival was examined. Additionally significant correlations existed between NLR and cervical stromal involvement, cytology positivity, and stage.

Conclusion: The prognostic factors for lymph node metastasis are NLR, PLR, and ELR. Only ELR is predictive of 5-year survival, but more prospective studies on ELR survival prediction are needed.

Keywords: Neutrophil-to-lymphocyte ratio, platelet-to-lymphocyte ratio, eosinophil-to-lymphocyte ratio, endometrial cancer

ÖZ

Amaç: Kansere bağlı inflamasyonlar çeşitli solid tümörlerde uzun süreli kötü sonuçlarla ilişkilidir. Bu çalışmada endometrial kanserde preoperative nötrofil lenfosit oranı, platelet lenfosit oranı ve diğer sistemik inflamatuar belirteçlerin oranlarının lenf nodu metastazını ve 5 yıllık sağ kalımı öngörmedeki etkisinin araştırılması amaçlanmıştır.

Gereç ve Yöntemler: Hastanemizde post operatif patolojisinde endometrium kanseri tanısı olan 379 olgunun preoperative nötrofil lenfosit, platelet lenfosit, monosit lenfosit, eozonofil lenfosit oranlarının lenf nodu metastazı ve 5 yıllık sağ kalım ile ilişkisi araştırıldı. Hastaların preoperatif tam kan sayımından elde edilen lökosit, nötrofil, lenfosit, monosit, eozinofil, platelet sayılarının lenfosit ile oranı değerlendirildi. Bütün hastalara total abdominal histerektomi ve bilateral salpingo-ooforektomi (TAH+BSO) uygulanmış olup gerekli vakalara bilateral pelvik ± paraaortik lenf nodu diseksiyonu ve omentektomi de yapıldı. Bütün sitoloji ve postoperative materyaller üniversitemizin patoloji laboratuvarında değerlendirildi. Evrelemede ise FIGO 2009 cerrahi evreleme sistemi kullanıldı.

Bulgular: Çalışmamızın sonuçları, lenf nodu metastazı ile NLR, eozinofil-lenfosit oranı (ELR) ve PLR arasında anlamlı korelasyonlar olduğunu gösterdi. 5 yıllık sağkalım incelendiğinde sadece ELR ile sağkalım arasında anlamlı bir ilişki mevcuttu. Ek olarak, NLR ile servikal stromal tutulum, sitoloji pozitifliği ve ever arasında anlamlı bir korelasyonlar vardı.

Sonuç: Lenf nodu metastazı için prognostic faktörler NLR, PLR veELR'dir. Yalnızca ELR, 5 yıllık sağkalımı öngörmektedir, ancak ELR sağkalım tahmini konusunda daha fazla prospektif çalışmaya ihtiyaç vardır.

Anahtar Kelimeler: Nötrofil-lenfositoranı, trombosit-lenfositoranı, eozinofil-lenfositoranı, endometriyal kanser

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INTRODUCTION

In developed nations, endometrial cancer is the type of gynecological cancer that is diagnosedmost frequently. The majority of patients are diagnosed early, with 80% diagnosed in stage 1, and the reported mean age of patients at the time of diagnosis is 63 years. The survival rates at 5 years are 95% in patients diagnosed in the early stages of the disease, 68% of patients with local metastasis, and 17% of patients with distant metastasis (1, 2). Patients frequently seek treatment because they experience abnormal and persistent bleeding and spotting (3).

The presence of an excessive amount of estrogen, either endogenous or exogenous, in the absence of a corresponding amount of progestin is considered the primary risk factor for endometrioid endometrial adenocarcinoma. Tamoxifen therapy, obesity, and a lack of previous children are three additional risk factors. In addition, it has been discovered that women who have Lynch syndrome have a significantly higher risk of developing endometrial cancer.

Endometrial cancer prognostic markers include myometrial invasion, the type 2 subtype, advanced stage of the illness, deep anorectal metastases, and lymph node metastasis (4, 5). Recent research has shown that a high ratio of peripheral neutrophils to lymphocytes (also known as NLR) is a poor prognostic indicator in a variety of cancers (6-8). It has been demonstrated that biomarkers of systemic inflammation, such as a high NLR, platelet-to-lymphocyte ratio (PLR), and absolute monocyte count, have the potential help direct the clinical management of cancer patients of various sorts. It has been demonstrated that high preoperative NLR and PLR values are related with poor prognosis in malignancies (9). The tumor microenvironment, in particular the inflammatory response, has a significant role in the development and progression of cancer, and this role may be associated with inflammation throughout the body. In light of the aforementioned context, The study's goal is to see if preoperative NLR, PLR, and other systemic inflammatory response indicators can predict lymph node metastases and 5-year survival in patients with endometrial cancer in the final pathology.

MATERIALS AND METHODS

A total of 379 patients who underwent hysterectomy and were later diagnosed with endometrial cancer on final pathology between 2006 and 2017 in a tertiary healthcare facility were included in this retrospective study. The study excluded patients whose final pathology did not reveal endometrial cancer, whose information could not be obtained, and who were not followed up.

The patients' postoperative final pathologies, preoperative complete blood counts and CA 125, CA 19-9, CA 15-3 values were collected. The hospital's computer program, Probel (Probel Yazılım ve Bilişim Sistemleri A.Ş., İzmir, Türkiye), was used to assess the patients' 5-year survival rates, and the patients were contacted using the phone numbers stored in the system. For the survival analysis, patients who were not followed up, were not reachable by phone and dead cases due to non-cancer disease were excluded.

Patient age, obstetric history (gravida, parity counts), leukocyte, neutrophil, lymphocyte, monocyte, eosinophil, and platelet counts, surgical stage, grade of hysterectomy specimen, tumor size, presence of lymphovascular invasion, presence of cervical stromal invasion, myometrial invasion status and degree, lymph node metastasis, and lymph node type were all the considered factors.

The preoperative total neutrophil, monocyte, eosinophil, and platelet counts were divided by the lymphocyte count to obtain the NLR, monocyte-to-lymphocyte ratio (MLR), eosinophil-to-lymphocyte ratio (ELR), and PLR values.

All patients underwent bilateral pelvic paraaortic lymph node dissection and omentectomy in addition to total abdominal hysterectomy and bilateralsalpingo-oophorectomy (TAH + BSO). The pathology lab at our university evaluated all cytology and postoperative specimens. The staging system used was the FIGO 2009 surgical staging system.

Ethics Statement

Our institutional review board granted approval for the study (No. 271/Date: 29.11.2017). Due to the study's retrospective nature, the need for formal informed consent was waived. The 1964 Helsinki Declaration of Principles served as the guide for this study's conduct.

Statistical Analysis

IBM SPSS v23 was used to analyze the data. The Kolmogorov-Smirnov test was used to determine if quantitative data conformed to the normal distribution. The Mann-Whitney U test was used to compare non-normally distributed parameters between non-survivors and survivors. Spearman rank correlation was used to analyze the relationship between variables. Quantitative data analysis results are presented as the mean and standard deviation or the median with minimum and maximum. All categorical variables are expressed in terms of the frequency and percentage. The level of significance was determined to be $P<0.05$. The data were analyzed using the Mann-Whitney U test as a statistical technique.

RESULTS

The mean age of 379 patients diagnosed with endometrial cancer as a result of postoperative pathology was 60.6 years (SD ± 9.9; age range 32-91). The mean gravida of the patients was 3.2 (SD ± 0.1; range 0-16). The mean parity value of the patients was 2.6 (SD ± 1.7; range 0-16).

When the patients were evaluated according to the results of CA 125, CA15-3, and CA19-9, the average CA 125 was 58.5U/ml (SS ± 202.1U/ml; CA 125 distribution 3-2180 U/ml), CA 15-3 was 20.8U/ml (SS ± 17.0U/ml; CA 15-3 distribution 3-110 U/ml) and CA19-9was 43.8U/ml (SS ± 173.7U/ml; CA19-9 distribution1-2338 U/ml).

The demographic data of the patients and the values obtained from the preoperative complete blood count are shown in Table 1.

Table 2 showsthe postoperative pathology findings and 5-year survival of the patients.

In Table 3, the postoperative pathology findings and preoperative systemic inflammatory response markers are compared.

DISCUSSION

NLR and PLR are popular options because they are frequently gathered before surgery. However, the predictive power of these markers are still unclear. Research on other cancers, such as esophageal squamous cell carcinoma (10), ovarian cancer (11), and gastric cancer (12), has provided the vast majority of information regarding the prognostic significance of NLR and PLR. Although a few studies (13-15) examined NLR or PLR in a small cohort of hepatocellular-carcinoma (HCC) patients, no study has examined the impact of both NLR and PLR on long-term outcomes in a sizable population of patients with various HCC malignancies. Additionally, small amount of research has been executed on how NLR and PLR work together to predict outcomes. Our study was notable as we included substantial cohort HCC patients who under went pancreatic and hepatic surgery. Even though NLR and PLR were not associated with immediate outcomes, such as the chance of perioperative problems, they were associated with long-term prognosis.Elevated NLR or PLR was specifically linked to 1.9-fold or 1.8-fold greater risk of long-term death, respectively. We also showed that combining NLR and PLR could provide significant prognostic differentiation because patients with low NLR and PLR values also had the greatest long-term results, whereas with elevated NLR and PLR values had the worst survival. Like other preoperative prognostic markers, NLR

Table 1. Age, parity, gravida, tumor markers, and preoperative hemogram values of the patients

	n	Minimum	Maximum	Mean ± Standard deviation
Age	379	32	91	60.6 (9.93)
Parity	378	0	16	2.6 (1.72)
Gravida	379	0	16	3.2 (2.06)
Total leukocyte count	379	2490	20790	8355.3 (2593.71)
Total neutrophil count	379	600	16580	5388.4 (2206.48)
Total lymphocyte count	379	270	15700	2747.9 (8007.82)
Total monocyte count	379	20	1190	467.9 (162.26)
Total eosinophil count	379	0	780	149.6 (115.96)
Total number of platelets	379	90500	691000	301112.1 (82352.04)
Hemoglobin	379	7.80	16.30	12.6 (1.58)
NLR	379	0.04	29.00	2.7 (2.45)
MLR	379	0.00	0.87	0.2 (0.12)
ELR	379	0.00	0.70	0.07 (0.07)
PLR	379	1.34	1666.67	151.1 (111.40)
CA 125	251	3	2180	58.5 (202.11)
CA 15-3	166	3	110	20.9 (17.03)
CA 19-9	198	1	2338	43.8 (173.70)

Table 2. Distribution of postoperative pathology results

		N	%
5-year survival	Alive	210	90.5
	Dead	22	9.5
Lymph node metastasis	Positive	63	16.6
	Negative	316	83.4
Tumor diameter	0-1 cm	29	7.7
	1-2 cm	75	19.8
	2-4 cm	159	42
	>4 cm	116	30.6
Histological type	Type 1	278	73.4
	Type 2	101	26.6
Lymphovascular invasion	Positive	79	20.8
	Negative	300	79.2
Cervical stromal invasion	Positive	61	16.1
	Negative	317	83.9
Myometrial invasion	<%50	234	61.7
	≥%50	145	38.3
Grade	Grade 1	176	48
	Grade 2	147	40.1
	Grade 3	44	12
Cytology	Benign	338	92.4
	Malignant	28	7.6
Lymph node type in lymph node-positive patients	Pelvic	32	50.8
	Paraaortic	2	3.2
	Pelvic + Paraaortic	29	46
Histological type	Endometrioid	309	81.5
	Mucinous	4	1.1
	Serous	10	2.6
	Mix	44	11.6
	Others	12	3.2
Stage	1a	211	55.8
	1b	67	17.7
	2	23	6.1
	3a	11	2.9
	3b	2	0.5
	3c1	11	2.9
	3c2	30	7.9
	4a	9	2.4
	4b	14	3.7

and PLR can be used to assess the relative benefits of surgery, the treatment alternatives (such as neoadjuvant therapy), and the rigor of follow-up surveillance programs. It is noteworthy that the effects of NLR and PLR were observed for each type of HCC cancer studied.

The most important discovery made in our study was the correlation between preoperatively high NLR, ELR, and PLR values and the presence of lymph node metastasis. There was no discernible connection between MLR and the presence of pathological lymph nodes. There are studies that have been published on the evaluation of preoperative hematological markers in the diagnosis of endometrial cancer, cervical stromal invasion, and lymph node metastasis. These studies can be found in the relevant academic literature (16-19). According to the findings of several studies, NLR, PLR, and MLR are all associated with a lower likelihood of endometrial cancer survival. It was determined that the combination of these markers increases their prognostic value (20). A retrospective study was conducted in which the researchers

Table 3. Comparison of postoperative pathology findings and survival in terms of preoperative systemic inflammatory response markers

		NLR	P	MLR	P	ELR	P	PLR	P
Myometril invasion	<%50	2.2(1.6-2.9)	0.142	0.20(0.15-0.25)	0.152	0.05(0.03-0.08)	0.001	125.5(102.46-163.91)	0.045
	≥%50	2.3(1.8-3.0)		0.21(0.16-0.27)		0.07(0.03-0.10)		134.38(108.62-182.47)	
Lympho vascular invasion	Negative	2.2(1.6-2.9)	0.382	0.20(0.15-0.25)	0.758	0.05(0.03-0.08)	0.001	126.06(102.42-165.10)	0.044
	Positive	2.3(1.8-3.1)		0.20(0.17-0.27)		0.07(0.04-0.10)		140.38(111.49-182.10)	
Cervical stromal invasion	Negative	2.1(1.6-2.8)	0.005	0.19(0.16-0.25)	0.213	0.05(0.03-0.08)	0.064	125.64(103.00-164.88)	0.054
	Positive	2.6(1.9-3.9)		0.21(0.17-0.28)		0.07(0.03-0.10)		141.25(109.20-195.01)	
Cytology	Benign	2.2(1.7-2.8)	0.018	0.20(0.16-0.25)	0.207	0.05(0.03-0.09)	0.034	126.81(102.85-165.38)	0.014
	Malignant	2.7(2 -7.1)		0.21(0.17-0.52)		0.08(0.05-0.10)		154.21(118.72-259.37)	
Stage	Stage 1	2.2(1.6-2.8)	0.010	0.19(0.15-0.24)	0.012	0.05(0.03-0.08)	0.005	125.61(102.46-164.66)	0.037
	Stage 2	2.4(1.9-3.1)		0.23(0.17-0.27)		0.05(0.03-0.10)		129.30(97.82-195.65)	
	Stage 3	2.2(1.8-2.9)		0.20(0.15-0.27)		0.07(0.03-0.10)		131.69(111.97-163.92)	
	Stage 4	2.9(1.9-7.2)		0.26(0.20-0.55)		0.09(0.04-0.13)		164.76(115.50-307.83)	
Type	Type 1	2.2(1.6-2.9)	0.556	0.20(0.16-0.25)	0.389	0.06(0.03-0.08)	0.930	127.29(102.42-167.61)	0.263
	Type 2	2.3(1.8-2.9)		0.21(0.16-0.27)		0.05(0.03-0.09)		134.23(107.56-168.56)	
Grade	Grade 1	2.1(1.6-2.8)	0.216	0.20(0.15-0.25)	0.339	0.05(0.03-0.85)	0.932	124.80(98.05-163.03)	0.053
	Grade 2	2.3(1.7-3.1)		0.21(0.17-0.26)		0.06(0.02-0.09)		131.93(104.83-182.76	
	Grade 3	2.2(1.7-2.8)		0.21(0.16-0.28)		0.05(0.02-0.10)		141.48(111.90-166.32)	
Lymph node metastasis	Negative	2.2(1.6-2.8)	0.003	0.20(0.16-0.25)	0.226	0.05(0.03-0.08)	0.002	125.61(102.16-163.81)	0.003
	Positive	2.5(1.9-4.0)		0.21(0.16-0.33)		0.07(0.04-0.11)		141.92(113.64-184.43)	
Survival	Alive	2.3(1.7-3.1)	0.672	0.21(0.16-0.26)	0.882	0.05(0.03-0.09)	0.039	127.82(102.85-170.02)	0.888
	Dead	2.1(1.6-3)		0.21(0.14-0.30)		0.09(0.04-0.11)		140.89(113.49-160)	
Tumor diameter	0-1	1.9(1.6-2.4)	0.053	0.16(0.13-0.27)	0.072	0.04(0.03-0.07)	0.005	119.37(96.80-162.20)	0.063
	1-2	2.2(1.6-2.9)		0.20(0.16-0.24)		0.04(0.02-0.07)		126.55(109.16-163.82)	
	2-4	2.2(1.6-2.8)		0.20(0.16-0.25)		0.05(0.03-0.08)		124.12(98.54-162.69)	
	>4	2.5(1.9-3.2)		0.22(0.17-0.27)		0.06(0.04-0.10)		140.82(110.54-193.84)	
Histological type	Endometrioid	2.2(1.7-2.9)	0.748	0.20(0.16-0.25)	0.563	0.05(0.03-0.08)	0.614	128.12(103.14-167.21)	0.411
	Mucinous	3.4(1.8-6.2)		0.23(0.19-0.41)		0.04(0.01-0.08)		162.54(134.07-304.55)	
	Serous	2.4(1.8-3.2)		0.20(0.14-0.26)		0.06(0.02-0.10)		127.09(108.57-179.56)	
	Mix	2.2(1.7-3.0)		0.23(0.15-0.30)		0.05(0.03-0.09)		122.99(103.03-171.22)	
	MMMT	2.2(1.5-2.7)		0.19(0.15-0.25)		0.06(0.03-0.09)		119.76(92.83-141.36)	

evaluated patients with endometrial cancer. In this study, they examined the patients' preoperative NLR, PLR, MPV, and monocyte count in terms of clinicopathological prognostic factors and overall survival. Similar studies were conducted. In terms of advanced-stage diseases, the NLR, monocyte count, and PLR values were found to be statistically significant. However, the researchers discovered that only the monocyte count was significant in terms of the disease grade. A more advanced disease stage, deep myometrial invasion, cervical involvement, lymphovascular space invasion, and nodal involvement were found to be associated with higher NLR and PLR values (15, 17). On the other hand, Kadan et al. (21) conducted a retrospective study in which they compared lymph node-positive patients and lymph node-negative patients among 534 endometrial cancer patients who had undergone hysterectomy and lymph node dissection. These patients had been diagnosed with endometrial cancer. Univariate analysis showed that the lymph node-positive group had a higher mean NLR value than the lymph node-negative group (2-4, 9). Their multivariate analysis

results showed that a low body mass index (BMI) is an independent predictor of nodal metastasis. They concluded that having a low BMI is a risk factor for the involvement of lymph nodes in cases of low-risk endometrial cancer. According to their findings, the NLR value was able to accurately predict lymph node involvement (16). In their study of 197 patients with endometrial cancer, Aoyama et al. (22) reported that high preoperative NLR and PLR values were predictive of lymph node metastasis. These levels were measured before the patients underwent surgery (17, 23, 24).

When the NLR, MLR, and PLR values were compared for 5-year survival, our research did not uncover anystatistically significant differences. We found a correlation between high ELR values and a lower likelihood of survival. In a study by Holub and Biete (25) of 163 patients with endometrial cancer, the preoperative ELR and survival were compared, and they found that high ELR and eosinophil / neutrophil to lymphocytes ratio (ENLR) values were associated with poor survival ($p = 0.004$ and $p = 0.010$). This was the case regardless of which ratio was examined. This is the first study to suggest that the ratio of eosinophils to lymphocytes is a factor in determining whether a patient will survive endometrial cancer (25). Our study is the second one that has been done on this topic that has been published.

In the course of our research, we discovered that only the NLR value for cervical stromal involvement showed a statistically significant difference. NLR values were determined to be significantly higher in patients who had cervical involvement. The MLR, ELR, and PLR values did not show any significant differences in terms of cervical stromal involvement. Acikgoz et al.(26), on the other hand, explored whether preoperative NLR and PLR can accurately predict cervical stromal invasion in patients with endometrioid endometrial adenocarcinoma. They found no significant correlation between PLR and cervical stromal involvement, whereas NLR hadsignificant predictive value for cervical stromal involvement (26). According to the findings of Wang and colleagues, patients with endometrial cancer who have high preoperative NLR and PLR values ($p = 0.009$ and $p = 0.031$) are more likely to have cervical invasion (16).

According to the findings of our research, there was a statistically significant difference between ELR and PLR in terms of lymphovascular space invasion; however, there was no difference between NLR and MLR values in terms of lymphovascular invasion. According to the findings of a meta-analysis conducted byPergialiotis et al. (27), the NLR values of patients with endometrial cancer were significantly higher than those of controls. They also demonstrated an increase in PLR and NLR values in patients with advanced disease, which was characterized by the presence of positive lymph nodes, involvement of the lymphovascular space, and distant metastases. To obtain reliable findings in this field, additional research needs to be conducted, and those studies should focus specifically on patients with advanced disease (26, 27).

Immune markers such as NLR and PLR may aid in stratifying the prognosis of cancer patients undergoing surgery. Our study has a number of strengths, including a sufficient number of patients from a single center, the evaluation of a large number of systemic inflammatory response markers, and the analysis of survival rates. The fact that our study was only conducted at one location and used retrospective data are its primary limitations.

In patients with endometrial adenocarcinoma, there were significant associations between preoperative NLR and cervical stromal involvement, cytology positivity, and stage in our study of systemic inflammatory response markers. Only ELR was significantly correlated with 5-year survival. However, additional prospective studies with factors that influence survival of cancer patient such as treatment modality, type of surgery and type of adjuvant therapy are necessary for the estimation of survival and to determine how ELR predicts survival

In addition, we discovered a significant correlation between NLR, ELR, and PLR levels and pathological lymph node positivity in our study. There was no correlation between MLR and pathological lymph nodes. The NLR, ELR, and PLR values werehigher in the group with positive lymph nodes. The high NLR and PLR values observed in our study in the lymph node metastasis-positive group are consistent with those of prior studies. Again, prospective studies are needed to confirm the predictive value of ELR for lymph node metastatic disease.

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ZK, SA : Conception, SA, AY : Supervision, ZK, AG, AY : Critical Review, ZK, AG : Analysis and Interpretation, ZK, AY : Data Collection, AY, AG : Design, ZK, AY, EOK : Findings, ZK, AY : Materials, ZK, AG : Writing, ZK, AG, EOK : Literature Review

REFERENCES

1. Lee NK, Cheung MK, Shin JYet al. (2007) Prognostic factors for uterine cancer in reproductive-aged women. Obstet Gynecol 109:655-662. https://doi.org/10.1097/01.AOG.0000255980.88205.15
2. Colombo N, Creutzberg C, Amant Fet al. Esmo-Esgo-Estro Endometrial Consensus Conference Working Group (2016) ESMO-ESGO-ESTRO consensus conference on endometrial cancer: diagnosis, treatment and follow-up. Int J Gynecol Cancer 26:2-30. https://doi.org/10.1097/IGC.0000000000000609

3. Kavurmaci SA, Gulbahar A (2020) Kadınların anormal uterin kanama hakkındaki bilgi durumlarının saptanması. Anadolu Hemşire Sağlık Bilim Derg 23:389-396
4. Di Saia PJ, Creasman WT (2012) Adenocarcinoma of the uterine corpus. Elsevier, Philadelphia
5. Tangjitgamol S, Anderson BO, See HT et al. (2009) Management of endometrial cancer in Asia: consensus statement from the Asian Oncology Summit 2009. Lancet Oncol 10:1119-1127. https://doi.org/10.1016/S1470-2045(09)70290-6
6. Grivennikov SI, Greten FR, Karin M (2010) Immunity, inflammation, and cancer. Cell 140:883-899. https://doi.org/10.1016/j.cell.2010.01.025
7. O'Callaghan DS, O'Donnell D, O'Connell F, O'Byrne KJ (2010) The role of inflammation in the pathogenesis of non-small cell lung cancer. J Thorac Oncol 5:2024-2036. https://doi.org/10.1097/jto.0b013e3181f387e4
8. Aggarwal BB, Vijayalekshmi RV, Sung B (2009) Targeting inflammatory pathways for prevention and therapy of cancer: short-term friend, long-term foe. Clin Cancer Res 15:425-430. https://doi.org/10.1158/1078-0432.CCR-08-0149
9. Clarke SJ, Chua W, Moore Met al. (2011) Use of inflammatory markers to guide cancer treatment. Clin Pharmacol Ther 90:475-478. https://doi.org/10.1038/clpt.2011.122
10. Feng JF, Huang Y, Chen QX (2014) Preoperative platelet lymphocyte ratio (PLR) is superior to neutrophil lymphocyte ratio (NLR) as a predictive factor in patients with esophageal squamous cell carcinoma. World J Surg Oncol 12:58. https://doi.org/10.1186/1477-7819-12-58
11. Asher V, Lee J, Innamaa A, Bali A (2011) Preoperative platelet lymphocyte ratio as an independent prognostic marker in ovarian cancer. Clin Transl Oncol 13:499-503. https://doi.org/10.1007/s12094-011-0687-9
12. Lee S, Oh SY, Kim SH et al. (2013) Prognostic significance of neutrophil lymphocyte ratio and platelet lymphocyte ratio in advanced gastric cancer patients treated with FOLFOX chemotherapy. BMC Cancer 13:350. https://doi.org/10.1186/1471-2407-13-350
13. Bertuzzo VR, Cescon M, Ravaioli M et al. (2011) Analysis of factors affecting recurrence of hepatocellular carcinoma after liver transplantation with a special focus on inflammation markers. Transplantation 91:1279-1285. https://doi.org/10.1097/TP.0b013e3182187cf0
14. Smith RA, Bosonnet L, Raraty M et al. (2009) Preoperative platelet-lymphocyte ratio is an independent significant prognostic marker in resected pancreatic ductal adenocarcinoma. Am J Surg 197:466-472. https://doi.org/10.1016/j.amjsurg.2007.12.057
15. Li X, Chen ZH, Ma XK et al. (2014) Neutrophil-to-lymphocyte ratio acts as a prognostic factor for patients with advanced hepatocellular carcinoma. Tumour Biol 35:11057-11063. https://doi.org/10.1007/s13277-014-2360-8
16. Wang D, Yang JX, Cao DY et al. (2013) Preoperative neutrophil-lymphocyte and platelet-lymphocyte ratios as independent predictors of cervical stromal involvement in surgically treated endometrioid adenocarcinoma. Onco Targets Ther 6:211-216. https://doi.org/10.2147/OTT.S41711
17. Suh DH, Kim HS, Chung HH et al. (2012) Pre-operative systemic inflammatory response markers in predicting lymph node metastasis in endometrioid endometrial adenocarcinoma. Eur J Obstet Gynecol Reprod Biol 162:206-210. https://doi.org/10.1016/j.ejogrb.2012.02.028
18. Acmaz G, Aksoy H, Unal D et al. (2014) Are neutrophil/lymphocyte and platelet/lymphocyte ratios associated with endometrial precancerous and cancerous lesions in patients with abnormal uterine bleeding? Asian Pac J Cancer Prev 15:1689-1692. https://doi.org/10.7314/apjcp.2014.15.4.1689
19. Ural UM, Sehitoglu I, Tekin YB, Sahin FK (2015) Neutrophil-to-lymphocyte and platelet-to-lymphocyte ratios in patients with endometrial hyperplasia and endometrial cancer. J Obstet Gynaecol Res 41:445-448. https://doi.org/10.1111/jog.12536
20. Cong R, Kong F, Ma J, Li Q, Wu Q, Ma X (2020) Combination of preoperative neutrophil-lymphocyte ratio, platelet-lymphocyte ratio and monocyte-lymphocyte ratio: a superior prognostic factor of endometrial cancer. BMC Cancer 20:464. https://doi.org/10.1186/s12885-020-06953-8
21. Kadan Y, Calvino AS, Katz A, Katz S, Moore RG (2017) Predictors for lymph nodes involvement in low risk endometrial cancer. J Obstet Gynaecol 37:514-518. https://doi.org/10.1080/01443615.2017.1281895
22. Aoyama T, Takano M, Miyamoto M et al. (2019) Pretreatment neutrophil-to-lymphocyte ratio was a predictor of lymph node metastasis in endometrial cancer patients. Oncology 96:259-267. https://doi.org/10.1159/000497184
23. Muzykiewicz KP, Iwanska E, Janeczek M, Glanowska I, Karolewski K, Blecharz P (2021) The analysis of the prognostic value of the neutrophil/ lymphocyte ratio and the platelet/lymphocyte ratio among advanced endometrial cancer patients. Ginekol Pol 92:16-23. https://doi.org/10.5603/GP.a2020.0164
24. Ni L, Tao J, Xu J et al. (2020) Prognostic values of pretreatment neutrophil-to-lymphocyte and platelet-to-lymphocyte ratios in endometrial cancer: a systematic review and meta-analysis. Arch Gynecol Obstet 301:251-261. https://doi.org/10.1007/s00404-019-05372-w
25. Holub K, Biete A (2018) New pre-treatment eosinophil-related ratios as prognostic biomarkers for survival outcomes in endometrial cancer. BMC Cancer 18:1280. https://doi.org/10.1186/s12885-018-5131-x
26. Acikgoz AS, Cakmak B, Tuten A et al. (2017) Can preoperative neutrophil to lymphocyte and platelet to lymphocyte ratios predict cervical stromal involvement in endometrioid endometrial adenocarcinoma? Eur J Gynaecol Oncol 38:20-24
27. Pergialiotis V, Oikonomou M, Damaskou V et al. (2018) Platelet to lymphocyte and neutrophil to lymphocyte ratio as predictive indices of endometrial carcinoma: findings from a retrospective series of patients and meta-analysis. J Gynecol Obstet Hum Reprod 47:511-516. https://doi.org/10.1016/j.jogoh.2018.08.016

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Evaluation of inflammation markers and pregnancy outcomes of patients undergoing intrauterin insemination (IUI) for unexplained infertility

Açıklanamayan infertilite nedeniyle intrauterin inseminasyon (IUI) yapılan hastaların inflamasyon belirteçleri ve gebelik sonuçlarının değerlendirilmesi

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ABSTRACT

Aim: This study aimed to compare the inflammatory markers in patients who had ovu-lation induction with clomiphene citrate (CC) and who underwent intrauterine insemi-nation (IUI) due to unexplained infertility in patients who could get pregnant and who could not.

Materials and Methods: The study included 125 females with unexplained infertility who underwent ovulation induction with CC and who underwent IUI at the Health Sciences University Ankara Etlik Zübeyde HanımGynecology Training and Research Hospital Assisted-Reproduction Therapy Clinic between July 2019 and December 2019. Of the patients, 104 (83.2%) of them could not get pregnant as a result of IUI, and 21 (16.8%) females got pregnant. Hemogram parameters collected from patients on the day of IUI were recorded.

Results: In terms of age, infertility duration, BMI, gravida, parity, number of living children, abortion and stillbirth numbers, no statistically significant difference was found between the two patient groups which were created based on getting pregnant or not ($p>0.05$). No significant difference was found between the groups in terms of se-rum estrogen, progesterone, follicle-stimulating hormone (FSH), luteinizing hormone (LH), thyroid stimulating hormone (TSH), prolactin, and anti-mullerian hormone (AMH) levels, hemoglobin, white blood cell count, neutrophil count, lymphocyte count, platelet count, MPV, CRP, and P/ ($p>0.05$). A statistically significant difference was found in terms of N/L ($p<0.05$). The N/L ratio was found to be higher in the group whose members could not get pregnant after IUI compared to the group whose members could get pregnant after IUI.

Conclusion: We found that increased N/L is a marker that may negatively affect IUI success. According to these results, we believe that increased inflammation and throm-bosis may negatively impact pregnancy rates. When beginning treatment with assisted reproductive technology, hemogram parameters can be used as a guide as a simple and routine examination to predict pregnancy success, and it is a cost-effective method. However, larger series of studies and other inflammatory markers are needed.

Keywords: Unexplained infertility, intrauterine insemination, inflammation marker

ÖZ

Amaç: Bu çalışmada açıklanamayan infertilite nedeniyle klomifen sitrat (CC) ile ovülasyon indüksiyonu uygulanan ve intrauterin inseminasyon (IUI) yapılan hastalarda inflamasyon belirteçlerinin gebelik elde edilebilen ve gebelik elde edilemeyen hastalarda karşılaştırılması amaçlanmıştır.

Gereç ve Yöntemler: Çalışmaya Temmuz 2019 ile Aralık 2019 tarihleri arasında Sağlık Bilimleri Üniversitesi Ankara Etlik Zübeyde Hanım Kadın Hastalıkları Eğitim Araştırma Hastanesi Üremeye Yardımcı Tedavi Kliniği'nde açıklanamayan infertilite tanısı ile CC ile ovulasyon indüksiyonu uygulanan ve IUI yapılan 125 kadın dahil edil-di.Bunların 104 (%83.2)'ünde IUI sonucu gebelik elde edilemedi, 21 kadında (%16.8) gebelik elde edildi. Hastalardan IUI günü alınan hemogram parametreleri kaydedildi.

Bulgular: IUI sonucunda gebelik elde edilen ve elde edilemeyen her iki hasta grubu arasında; yaş, infertilite süresi, VKİ, gravida, parite, yaşayan çocuk sayısı, abortus ve ölü doğum sayıları açısından istatistiksel anlamlı farklılık saptanmadı ($p>0.05$). Her iki grup arasında; serum östrojen, progesteron, folikül uyarıcı hormon (FSH),lüteinleştirici hormon(LH), tiroid uyarıcı hormon (TSH), prolaktin ve anti müllerian hormon (AMH) düzeyleri, hemoglobin, beyaz küre sayısı, nötrofil sayısı, lenfosit sayısı, platelet sayısı, MPV, CRP ve P/L açısından istatistiksel anlamlı farklılık saptanmadı ($p>0.05$). N/L oranı açısından istatistiksel anlamlı farklılık saptandı ($p<0.05$). IUI sonrasında gebelik elde edilemeyen grupta, IUI sonrasında gebelik elde edilen gruba kıyasla N/L'nin daha yüksek olduğu belirlendi.

Sonuç: Çalışmamız sonucunda artmışN/L'ninIUI başarısını olumsuz yönde etkileyen bir belirteç olarak ortaya çıkmıştır. Bu sonuca göre artmış inflamasyonun ve trombozun gebelik oranlarını olumsuz etkileyebileceğini düşünüyoruz. Yardımcı üreme teknikleri ile tedaviye başlarken hemogram parametreleri, gebelik başarısını tahmin etmek için basit ve rutin bir muayene olarak yol gösterici olarak kullanılabilir ve uygun maliyetli bir yöntemdir. Bununla birlikte, daha büyük serilerde ve diğer inflamatuar belirteçlerin de incelendiği çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Açıklanamayan infertilite, intrauterin inseminasyon, inflamasyon markerleri

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INTRODUCTION

Infertility is defined as a couple's inability to have a baby despite having regular sexual intercourse for at least a year without using any form of contraception (1). Infertility affects 10-15% of the population and should be considered a couple's disease. When the World Health Organization (WHO) diagnosis protocols are examined, infertile couples are classified as having 40-45% female-related causes, 30-40% male-related causes, and the etiology of the infertility of the remaining 10-15% cannot be clarified or explained by diagnostic methods (2). Unexplained infertility refers to infertility condition in which the results of standard investigations, such as ovulation tests, tubal patency and uterine cavity compliance, and spermiogram, are normal, and while the underlying etiopathogenetic mechanisms are unknown, they are thought to be related to causes such as oocyte, tubal, or sperm function abnormalities that are not diagnosed by standard diagnostic procedures (3-6).

In patients with unexplained infertility due to altered levels of inflammatory markers, low-grade chronic inflammation is frequently blamed for the etiopathogenetic mechanisms of infertility (7, 8). Low-grade chronic inflammation is defined as an increase in inflammatory markers such as tumor necrosis factor-a (TNF-a), interleukin-1 (IL-1), interleukin-6 (IL-6) and C-reactive protein (CRP) (9, 10). Some studies suggest that some CBC parameters, such as white blood cell (WBC), neutrophil, and neutrophil-to-lymphocyte ratio (N/L), are also markers of inflammatory response (11-14). It has been shown that patients with endometriosis and polycystic ovary syndrome (PCOS) with infertility have a high N/L (15). Platelet-to-lymphocyte ratio (P/L) and mean platelet volume (MPV) have recently been identified as chronic inflammation markers (13, 16, 17). It has been demonstrated that the P/L is a biomarker of both thrombosis and inflammation, and platelet proliferation is thought to be the result of an ongoing pro-inflammatory process (18, 19). Furthermore, in patients with pancreatic or colorectal cancer, the P/L was found to be an independent risk factor for decreased survival (20, 21). Since platelet volume and platelet activation are closely related, MPV is an indicator of platelet activation (22).

It was determined that chronic inflammation can cause infertility. There are some studies on N/L, MPV and P/L in infertile women with PCOS (22). However, no studies have been conducted to examine the relationship between CBC inflammation markers and IUI outcomes in women with unexplained infertility. This study aimed to investigate whether CBC inflammation markers related to the possible role of chronic inflammation in infertility and IUI success are one of the etiopathogenetic mechanisms of unexplained infertility and whether there is a relationship between these markers and IUI success of women with unexplained infertility.

MATERIAL AND METHODS

The data of patients who received ovulation induction with clomiphene citrate (CC) or with CC and IUI treatment in the Reproductive Endocrinology and Infertility Clinic of University of Health Sciences Ankara Etlik Zübeyde Hanım Gynecology Training and Research Hospital between July 2019 and December 2019 were reviewed retrospectively. In line with the relevant university the permission by TUEK (Medical Specialty Education Board) and institutional permissions, the files of the patients included in the study were retrospectively reviewed from the patient files and electronic database and evaluated within the scope of the study.

Couples who could not conceive despite unprotected sexual intercourse for more than 1 year for couples whose female age was <35 years and more than 6 months for couples whose female age ≥35 were considered infertility. Patients aged between 18-42 years who were diagnosed with unexplained infertility and underwent IUI at the Infertility Clinic. Among the for the diagnosis of unexplained infertility who had normal ovarian morphology, no gynecologic pelvic pathology was detected on ultrasonographic examination, regular ovulatory cycles, normal spermiogram, normal hysterosalpingogram, no evidence of decreased ovarian reserve according to ovarian reserve tests.If any, and no pathology was detected in diagnostic laparoscopy, and patients with a BMI level of <30 kg/m2 were included in the study. Those with systemic diseases (hypertension, diabetes, asthma, etc.), endocrinologic abnormalities (hyper/hypothyroidism, hyperprolactinemia, etc.), proven by postmenopausal FSH levels, ovarian disease (endometrioma, etc.), hematologic disorders, malignancy, infectious disease or autoimmune disease, history of splenectomy, those who use anti-inflammatory drugs or glucocorticoids, patients with other chronic infections, hematologic disorders, malignancy, infectious disease or autoimmune disease, history of splenectomy, and other chronic inflammatory conditions (arthritis, etc.), patients which are smokers, and patients with a BMI≥30 kg/m² were excluded.

The study retrieved and reviewed file records of patients diagnosed with unexplained infertility and who underwent CC+IUI from the database. The study included 125 patients with unexplained infertility, and all patients received CC+IUI. The patients' age, BMI, duration of infertility, number of cycles, serum basal E2, basal FSH, basal LH, TSH, PRL, AMH, endometrial thickness on the day of HCG, follicle number and diameter on the day of HCG, on the day of IUI, WBC, neutrophils, lymphocytes, platelets, N/L, P/L, MPV, CRP, progesterone level (21th day of menstruation),pregnancy results were recorded and the results of the patients who achieved pregnancy post-treatment and those who did not were compared.

The statistical analysis was conducted in a computer environment using the SPSS Statistics 22 package program. Descriptive statistics and continuous variables are represented as mean, standard deviation, largest and smallest, respectively, whereas categorical variables are represented as number of cases (n) and percentage (%). The Kolmogorov-Smirnov test was used to assess variable distribution and normality analyses. When comparing the significant differences between study groups, Mann-Whitney U test and Independent Sample T-Test were used. The quantitative data was evaluated using Pearson's and Spearman's correlation tests. The 95% confidence interval was calculated for each variable, and the results were considered statistically significant for $p<0.05$.

RESULTS

In this study, 125 female patients aged between 18 and 42 with unexplained infertility underwent IUI after ovulation induction with CC. Demographic data of the females participated in the study are shown in Table 1.

Table 1. Distribution of demographic data of females who underwent IUI treatment

	Lowest - Highest	Mean
Age (years)	18-42	28.3±5.1
Duration of Infertility (month)	6-120	32.4±19.4
BMI (kg/m2)**	17-29	24±3.2
Gravida (n)	0-5	0.5±0.8
Parity (n)	0-3	0.28±0.6
Surviving Child (n)	0-3	0.28±0.6
Abortion (n)	0-3	0.21±0.54
Stillbirth (n)	0	0

*The results are given as mean (n). **BMI: Body Mass Index

In the follow-up of CC+IUI treatment applied to 125 female patients with unexplained infertility, it was found that CC+IUI treatment was unsuccessful in 104 (83.2%) of them and pregnancy did not occur. Of 21 (16.8%) females of whom CC+IUI treatment were successful, clinical pregnancy was detected in 20 (16%) of them and ectopic pregnancy in 1 (0.8%).

In terms of age, infertility duration, BMI, gravida, parity, number of living children, abortions, and stillbirths, no statistically significant difference was found between the groups ($p>0.05$). Table 2 shows the distribution of demographic data in terms of pregnancy status as a result of IUI in patients with unexplained infertility.

In 125 (100%) of the patients with unexplained infertility, ovulation induction with CC was performed. The meantreatment cycle for CC+IUI was 1.67±0.73 days, and the meanendometrial thickness was 8.62.4 mm. The mean number of follicles measuring 14-16 mm was determined as 0, while the mean number of follicles measuring 16-18 mm was 0.01±0.12 and the mean number of follicles measuring 18-20 mm was 1±0.36 (Table 3).

In terms of CC dose used for ovulation induction, number of cycles which pregnancy occur, endometrial thickness, and follicle sizes ($p>0.05$), no statistically significant difference was found between the group that did not achieve pregnancy with CC+IUI treatment and the group that did achieve pregnancy with CC+IUI treatment (Table 4).

In patients with unexplained infertility, a weak positive correlation between BMI measurements and CBC, lymphocyte count and platelet count (Figure 1) and a moderate positive correlation between BMI measurements and CRP were found (Figure 2) (WBC: $p<0.05$; r:0.231 and Lymphocyte count: $p<0.05$; r:0.299 and Platelet count: $p<0.05$; r:0.178 and CRP: $p<0.05$; r:0.439).

Table 2. Demographic Data Distribution in Terms of Pregnancy Occurred as a Result of IUI Treatment

	Pregnancy (-) n=104 (83.2%)	Pregnancy (+) n=20 (16%)	p
Age (years)	28.5±5.2	27.6±4.9	0.454[t]
Duration of Infertility (month)	32.5±19.7	32.1±18.8	0.842[m]
BMI (kg/m2)**	24±3.2	23.9±3.4	0.827[m]
Gravida (n)	0.5±0.95	0.4±0.5	0.742[m]
Parity (n)	0.2±0.6	0.3±0.4	0.284[m]
Surviving Child (n)	0.2±0.6	0.3±0.4	0.284[m]
Abortion (n)	0.2±0.5	0.04±0.2	0.119[m]
Stillbirth (n)	0	0	1[m]
BMI: Body Mass Index			

* The results are given as mean (n). **t: Independent Sample T-Test ***m: Mann Whitney-U Test

Table 3. Ultrasonographic and Gynecological Data Distribution in Terms of Pregnancy Occurred as a Result of IUI Treatment

	Pregnancy (-) n=104 (83.2%)	Pregnancy (+) n=20 (16%)	P
Clomiphene Citrate Dosage (mg/day)	55.7±17.4	54.7±15.03	0.876[m]
Number of Cycleswhich the pregnancy occur (n)	1.68±0.71	1.61±0.74	0.506[m]
Endometrial Thickness (mm)	8.5±2.4	9.1±2.6	0,337[t]
Dominant Follicle Sizes (HCG Day)			
14-16 mm	0	0	1 [m]
16-18 mm	0.001±0.09	0.04±0.2	0.207[m]
18-20 mm	1.1±0.3	1.04±0.5	0.217[m]

* The results are given as mean (n). **t: Independent Sample T-Test ***m: Mann Whitney-U Test

Table 4. Distribution of Early Follicular Phase Hormonal Data of Patients with Unexplained Infertility in terms of Pregnancy Status

	Pregnancy (-) n=104 (83.2%)	Pregnancy (+) n=20 (16%)	p
Estradiol (pg/ml)	45.7±20.7	41.6±16.8	0.392 [m]
Progesterone (ng/ml)	8.4±3.7	9±3.2	0.986[m]
FSH (mIU/ml)	7±1.8	7.2±1.7	0.646 [t]
LH (mIU/ml)	5.4±3.5	5.2±1.8	0.422[m]
TSH (mIU/l)	2±0.95	2±0.68	0.352[m]
Prolactin (ng/ml)	14.4±6.7	14.4±7.3	0.848 [m]
AMH (ng/ml)	3.9±2.5	4.1±2.2	0.632 [m]
FSH: Follicle Stimulating Hormone LH: Luteinizing Hormone TSH: Thyroid Stimulating Hormone AMH: Anti-Mullerian Hormone			

* The results are given as mean (n). **t: Independent Sample T-Test ***m: Mann Whitney-U Test

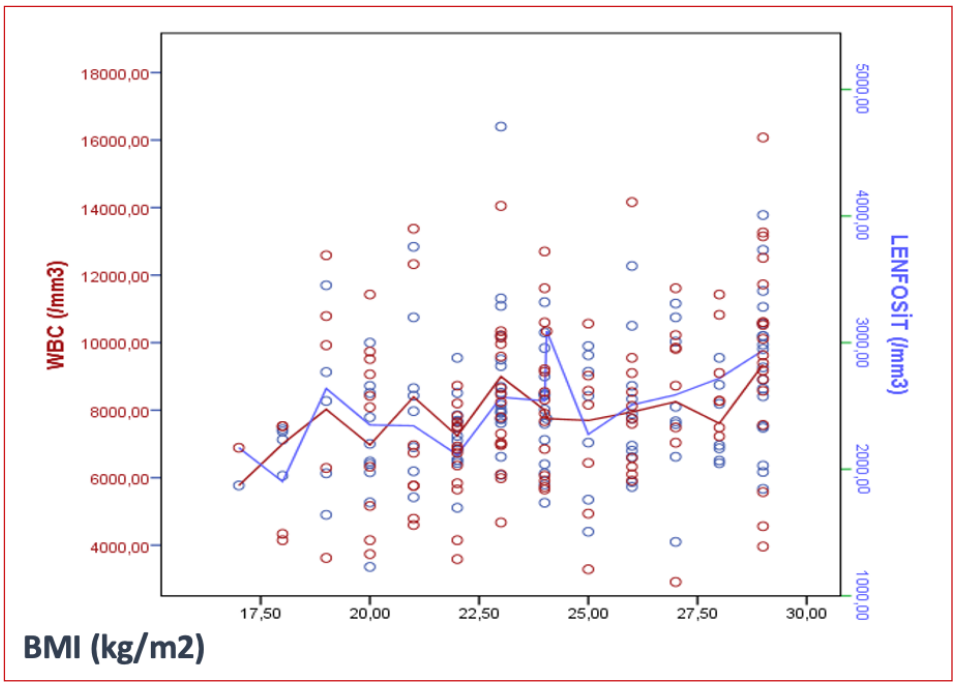

Figure 1. Correlation graph between BMI and WBC and lymphocyte counts in com-plete blood count

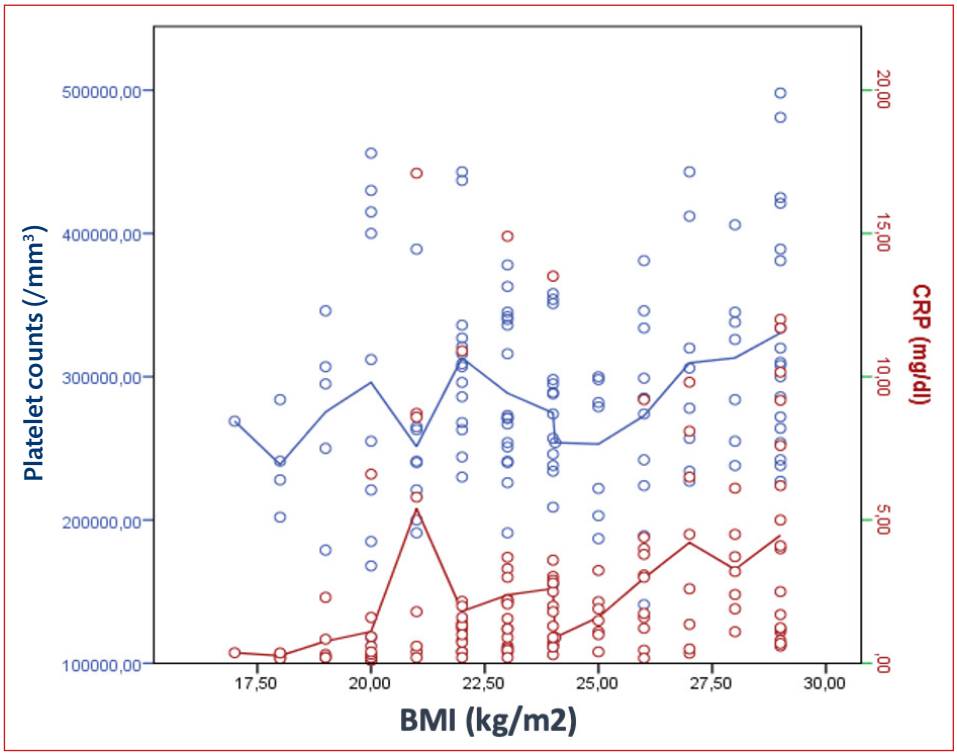

Figure 2. The graph demonstrating the correlation between BMI, platelet counts in complete blood count, and CRP

Table 5. Pregnancy Status Distribution of Complete Blood Count Parameters and Inflammatory Markers in Patients with Unexplained Infertility

	Pregnancy (-) n=104 (83.2%)	Pregnancy (+) n=20 (16%)	p
Hb (g/dl)	12.9±1.4	13.08±1.4	0.795[t]
WBC (/mm³)	8120±2017	8048±2295	0.883[t]
Neutrophil Count (/mm³)	4997±1589	4688±1802	0.428[t]
Lymphocyte Count (/mm³)	2455±673	2759±709	0.06[t]
Number of Platelets (/mm³)	289711±72182	296142±77022	0.713[t]
MPV (fl)	9.8±1.6	9.6±1.06	0.33[t]
N/L	2.1±0.77	1.74±0.61	0.028[m]
P/L	125.3±42.07	111.2±32.86	0.15[t]
CRP (mg/l)	2.91±3.54	1.94±2.06	0.394[m]

HB: Hemoglobin WBC: White Blood Cell N/L: Neutrophil/Lymphocyte Ratio P/L: Platelet Lymphocyte Ratio; CRP: C-Reactive Protein
* The results are given as mean (n). **t: Independent Sample T-Test ***m: Mann Whitney-U Test

The mean serum E2 level of patients with unexplained infertility was 45.02±20.1 pg/ml, while the mean serum progesterone level was 8.53±3.6 ng/ml. Their mean serum FSH level and mean serum LH level were respectively found to be 7.05±1.8 mIU/ml, and 5.42±3.35 mIU/ml. And the mean serum TSH level, the mean serum prolactin level and the mean serum AMH level were found to be 2±0.91 mIU/l, 14.4±6.8 ng/ml and 3.9±2.4 ng/ml, respectively. No statistically significant difference was found between the two groups in terms of serum E2, progesterone, FSH, LH, TSH, prolactin and AMH levels (p>0.05).

The mean hemoglobin level in the complete blood count of patients with unexplained infertility was detected as 13±1.41 g/dl. In the patients, the mean WBC was found to be 8108±2056 /mm³, mean neutrophil count to be 4945±1623 /mm³. While the mean lymphocyte count was 2506±686 /mm³, the mean platelet count was 290792±72736 /mm³. The mean platelet volume (MPV) was found to be 9.84±1.52 fl while the mean neutrophil/lymphocyte ratio (N/L) was found to be 2.07±0.76. While the mean platelet/lymphocyte ratio (P/L) was calculated as 122.9±40.8, the mean CRP level was calculated as 2.75±3.35 mg/dl. It was found that there

was no statistically significant difference in terms of hemoglobin, WBC, neutrophil count, lymphocyte count, platelet count, MPV, CRP and platelet/lymphocyte ratio (P/L) between the two groups which received CC+IUI treatment and divided based on the occurrence of pregnancy (p>0.05). Table 5 depicts the distribution of complete blood count parameters and inflammatory markers in terms of pregnancy status in patients with unexplained infertility.

A statistically significant difference was found between the groups who received CC+IUI treatment which was divided based on achieving pregnancy in terms of neutrophil/lymphocyte ratio (N/L) (p<0.05). The N/L ratio was found to be higher in the group in which pregnancy could not be achieved with CC+IUI treatment compared to the group in which pregnancy could be achieved with the aforementioned treatment (Figure 3).

A positive and weak statistically significant correlation was found between the infertility period of the patients and the neutrophil counts and N/L (Figure 4) (N/L: p<0.05; r:0.028 and neutrophil count: p<0.05).

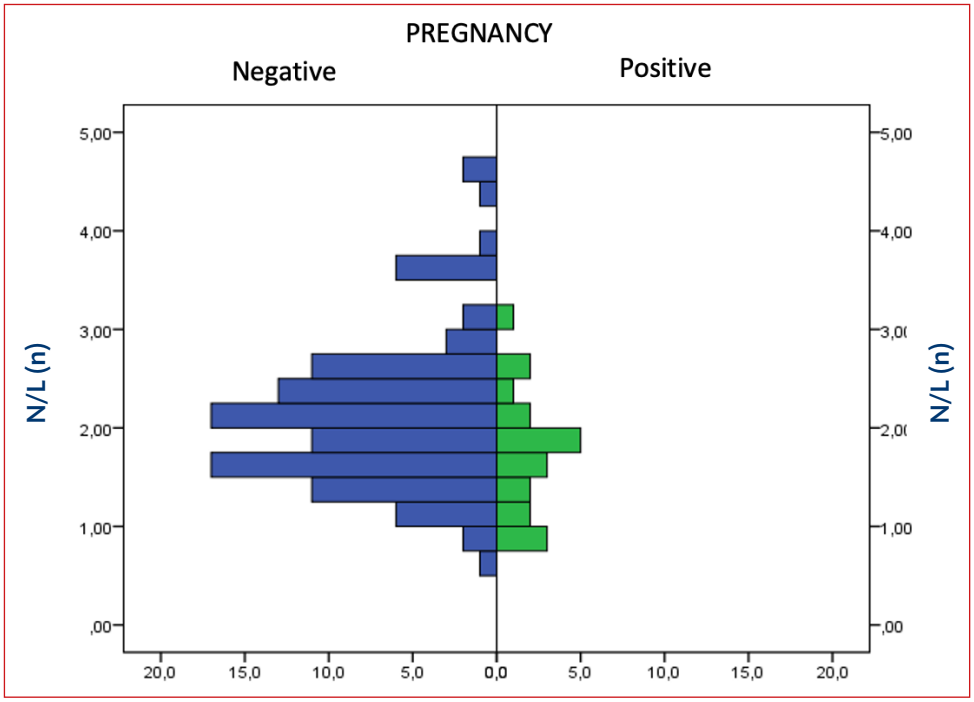

Figure 3. The graph showing the correlation between the pregnancy status and the N/L post-IUI-treatment

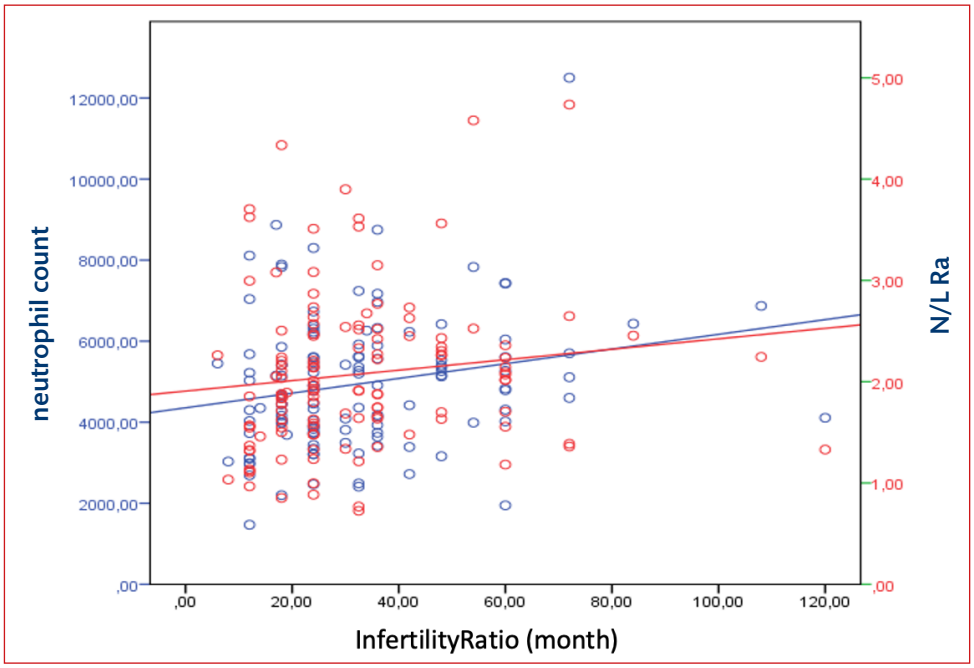

Figure 4. The graph showing the correlation between the duration of infertility and neu-trophil count and N/L in complete blood count

DISCUSSION

A negative statistically significant difference was found between the N/L and pregnancy between the group in whom pregnancy could not be achieved with CC+IUI treatment and in the group in whom pregnancy was achieved with CC+IUI treatment. It was found that there was no statistically significant difference between the groups in terms of WBC, neutrophil count, lymphocyte count, platelet count, MPV, P/L, and CRP. There was a statistically significant weak positive correlation between BMI measurements of the patients and WBC, lymphocyte count and platelet count, and a statistically significant moderate positive correlation between BMI measurements and CRP. A weak statistically significant positive correlation between the duration of infertility and neutrophil counts and N/L was observed.

Unexplained infertility is an infertility condition in which etiopathogenesis cannot be determined, although results of standard examinations including ovulation tests, tubal and uterine patency, and semen analysis are normal. Although the etiopathogenetic mechanisms are unclear, several mechanisms have been blamed, such as abnormalities related to ovarian, tubal or sperm function that cannot be diagnosed by standard diagnostic procedures. Recently, low-grade chronic inflammation has been blamed for altered levels of inflammatory markers (7). Studies have shown that ILs and pro-inflammatory factors are effective at the implantation stage in patients undergoing IVF(23). Studies have found elevated levels of interferon-γ (IFN-γ) and IL-2 and decreased TGF-β in the plasma of patients with unexplained infertility compared to fertile controls in the luteal phase (23). In addition, it has been shown that patients with unexplained infertility have higher serum levels of IL-2, IL-4, IL-6, IL-21, TNF-α and IFN-γ compared to fertile individuals (7). However, it is not cost-effective to measure these markers in all patients with unexplained infertility. IUI is one of the first preferred treatment options for infertile women who cannot get pregnant. Inflammation has been studied concerning assisted reproductive techniques (24). This study aimed to investigate whether whole blood parameters can be a guide in determining IUI success.

N/L hasbeen used as a marker of inflammation and predicting prognosis in malignancy, cardiovascular disease, autoimmune disease, endometriosis and PCOS in many studies. The N/L is an inexpensive and easily available marker that can be of practical use in the evaluation of chronic inflammatory conditions (25). According to a growing body of evidence, endometriosis may be a localized inflammatory disease with subclinical systemic manifestations (26, 27). Endometriosis has been linked to increased neutrophils and decreased lymphocytes, as well as systemic inflammation that shifts the differential WBC count (15). In a study of 745 patients (662 patients with endometriosis and 83 patients with benign ovarian tumor), Jing et al. found that the N/L was significantly higher in endometriosis compared to the control group and they suggested that it could be used as a marker (28). In contrast, they divided all endometriosis patients into groups based on their fertility status (fertile or infertile) and found that the N/L was significantly higher in the fertile group compared to the infertile group (15). In their study conducted with 153 patients (42 pregnant patients, and 111 infertile patients), Karlı et al. showed that although there was no statistical difference in patients who underwent IVF for unexplained infertility, the N/L tended to be higher in those who could not conceive compared to those who remained pregnant when median values were analyzed (29). Tola et al. discovered no significant difference in N/L between the two groups in a study of 246 patients (125 with unexplained infertility and 121 control subjects) (30). In addition, it was found that there was no significant difference between pregnancy status and N/L in patients treated for unexplained infertility (22). In their study, Çakıroğlu et al. evaluated the relationship between inflammation markers and pregnancy outcomes by regression analysis in 146 patients with PCOS undergoing IVF. It was found that there was no significant difference in the N/L (18). In our study, a statistically significant difference was found in terms of the N/L between the two groups in which pregnancy could not be achieved and in which pregnancy was achieved. We found that the N/L was higher in the group in which CC+IUI treatment was unsuccessful (pregnancy could not be achieved) when compared to the group in which CC+IUI treatment was successful.

Studies and meta-analyses have shown that obesity has negative effects on assisted reproductive techniques. It has been shown that adipose tissue can secrete hormones, adipokines, and cytokines and cause inflammation (31). Similar to our study, Heishanu et al. discovered a positive correlation between BMI and WBC, neutrophils, platelets, and CRP in 327 patients in their study (32). Madan et al. also found a positive correlation between CRP and BMI in their cross-sectional study of 80 patients (33). In order to objectively determine the effect of obesity in this direction, studies with a sufficient number of cases allowing comparison by grouping based on different BMI values must be designed. In the study, we discovered a statistically significant positive correlation between patients' BMI measurements and WBC, lymphocyte count, and platelet count at a positive and weak level, as well as a positive moderate correlation between BMI measurements and CRP.

We also found a weak statistically significant positive correlation between the duration of infertility and neutrophil counts and N/L. This may indicate that the duration of infertility is prolonged due to the deterioration of endometrial receptivity, fertilization and/or implantation due to chronic inflammation. Studies with a larger

sample size can be planned to delve deeper into the presence of weak positive correlations.

The P/L has recently emerged as a biomarker of the balance between thrombosis and inflammation. The ongoing pro-inflammatory state results in megakaryocytic lineage proliferation and relative thrombocytosis. High platelet counts and low lymphocyte counts have been proposed as risk indicators. They reflect both aggregation and the inflammatory pathway (18, 34). In their study conducted on 153 patients (42 pregnant patients and 111 infertile patients), Karlı et al. compared pregnancy and inflammation markers in patients who underwent IVF for unexplained infertility. In terms of MPV value, it was found that there was no significant difference between the two groups, but there was a significant difference in the P/L (29). In their study conducted with 292 patients (146 patients with PCOS, n:146), Çakıroğlu et al. reported that the P/L and MPV increased in patients with PCOS compared to the control group due to chronic inflammation. Furthermore, among 146 PCOS patients, MPV values were found to be significantly correlated with implantation and clinical pregnancy rates, and the P/L was found to be positively associated with miscarriages. In addition, a negative correlation was observed between WBC and neutrophil count, and oocyte count and oocyte quality (18). Tola et al. conducted a study with 246 patients (125 patients with unexplained infertility, and a control group consisting of 121 females) and found no significant difference between the two groups in terms of MPV and P/L (30). However, among patients with unexplained infertility, lymphocyte count was the only positive predictor for fertilization, and the P/L for implantation was the only negative predictor (22). In our study, although not statistically significant, we discovered that the median value of lymphocytes was lower and the median value of the P/L was higher in the group that could not conceive compared to those who did not become pregnant. In 129 patients who underwent IVF for unexplained infertility, Horikawa et al. discovered no correlation between pregnancy outcomes and CRP (35). Similarly, Taşdemir et al. found no difference in CRP levels between patients who had IUI and those who could not conceive in their study conducted on 42 patients (36). In our study, we found no statistically significant difference in terms of WBC, neutrophil count, lymphocyte count, platelet count, MPV, or P/L between the two groups that did not achieve pregnancy and those that did. Studies have shown that MPV and the P/L can be used as a marker of chronic inflammation. In our study, we did not find a significant difference in CRP values between both groups in accordance with the literature.

CONCLUSION

In our study, we found a statistically significant difference in terms of the N/L between the two groups in whom pregnancy was not achieved with CC+IUI treatment and pregnancy was achieved with CC+IUI treatment. We discovered that the N/L was higher in the group that received failed CC+IUI treatment versus the group that received successful CC+IUI treatment. Some studies show that chronic inflammation may be a factor in unexplained infertility. When beginning assisted reproductive techniques treatment, hemogram parameters can be used as a simple and routine guide to predicting pregnancy success rates and can be a guide for the evaluation of treatment options. Prospective studies with larger patient populations, as well as other assisted reproductive techniques, are needed.

Limitations

The sample size is small, there is no power calculation, and other ovulation induction treatments are not included. Another limitation is that the study was retrospective and data were obtained from a single center. In addition, one patient experienced an ectopic pregnancy thus she could not be included in the groups. Our study's strength is that it is the first to examine the relationship between WBC inflammation parameters, IUI treatment, and pregnancy outcome.

Conflict of Interest
No conflict of interest was declared by the authors.

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Authors' contributions
The authors contributed to the article as follows: Conceptualisation (HEK, MÇK), data collection (HEK, TE), data curation and analysis (HEK, TE), supervision and project administration (HEK, TE), writing original draft (MFK, HEK), review and editing (MFK, TE). All authors approved of the final version of the article prior to submission.

REFERENCES

1. Farquhar CM, Liu E, Armstrong S, Arroll N, Lensen S, Brown J. Intrauterine insemination with ovarian stimulation versus expectant management for unexplained infertility (TUI): a pragmatic, open-label, randomised, controlled, two-centre trial. Lancet. 2018;391(10119):441-50. Epub 2017/11/28.
2. L S, NH G, RG K. Clinical Gynecologic Endocrinology and Infertility2007.
3. Tafvizi F, Masomi M. Comparison of Serum Leptin Level in Women with Unexplained Infertility and Fertile Women in Iran. J Obstet Gynaecol India. 2016;66(Suppl 1):466-70. Epub 2016/09/22.
4. Blacker CM, Ginsburg KA, Leach RE, Randolph J, Moghissi KS. Unexplained infertility: evaluation of the luteal phase; results of the National Center for Infertility Research at Michigan. Fertil Steril. 1997;67(3):437-42. Epub 1997/03/01.
5. Guvenc G, Bektas Pardes B, Kinci MF, Karasahin KE. Effect of education and counselling on reducing pain and anxiety in women undergoing hysterosalpingography: A randomised controlled trial. Journal of Clinical Nursing. 2020;29(9-10):1653-61.
6. Kinci MF, Kinci OS. The opinions and thoughts of the women who had undergone hysterosalpingography for the first time: a qualitative study. International Journal of Caring Sciences. 2020;13(1):683-91.

7. An LF, Zhang XH, Sun XT, Zhao LH, Li S, Wang WH. Unexplained infertility patients have increased serum IL-2, IL-4, IL-6, IL-8, IL-21, TNFα, IFNγ and increased Tfh/CD4 T cell ratio: increased Tfh and IL-21 strongly correlate with presence of autoantibodies. Immunol Invest. 2015;44(2):164-73. Epub 2014/07/18.
8. Gong Q, Zhu Y, Pang N, Ai H, Gong X, La X, et al. Increased levels of CCR7(lo) PD-1(hi) CXCR5(+) CD4(+) T cells, and associated factors Bcl-6, CXCR5, IL-21 and IL-6 contribute to repeated implantation failure. Exp Ther Med. 2017;14(6):5931-41. Epub 2017/12/30.
9. Repaci A, Gambineri A, Pasquali R. The role of low-grade inflammation in the polycystic ovary syndrome. Mol Cell Endocrinol. 2011;335(1):30-41. Epub 2010/08/17.
10. Orio F, Jr., Palomba S, Cascella T, Di Biase S, Manguso F, Tauchmanovà L, et al. The increase of leukocytes as a new putative marker of low-grade chronic inflammation and early cardiovascular risk in polycystic ovary syndrome. J Clin Endocrinol Metab. 2005;90(1):2-5. Epub 2004/10/16.
11. Lee CD, Folsom AR, Nieto FJ, Chambless LE, Shahar E, Wolfe DA. White blood cell count and incidence of coronary heart disease and ischemic stroke and mortality from cardiovascular disease in African-American and White men and women: atherosclerosis risk in communities study. Am J Epidemiol. 2001;154(8):758-64. Epub 2001/10/09.
12. Brown DW, Giles WH, Croft JB. White blood cell count: an independent predictor of coronary heart disease mortality among a national cohort. J Clin Epidemiol. 2001;54(3):316-22. Epub 2001/02/27.
13. Templeton AJ, Ace O, McNamara MG, Al-Mubarak M, Vera-Badillo FE, Hermanns T, et al. Prognostic role of platelet to lymphocyte ratio in solid tumors: a systematic review and meta-analysis. Cancer Epidemiol Biomarkers Prev. 2014;23(7):1204-12. Epub 2014/05/06.
14. Elmas B, Kinci MF, Gök İE, Alkan A, Toğrul C, Sarikaya E. Is higher IgE levels in preeclamptic pregnancies suggest autoimmune pathophysiology? Çukurova Medical Journal. 2019;44:547-54.
15. Jing X, Li C, Sun J, Peng J, Dou Y, Xu X, et al. Systemic Inflammatory Response Markers Associated with Infertility and Endometrioma or Uterine Leiomyoma in Endometriosis. Ther Clin Risk Manag. 2020;16:403-12. Epub 2020/06/05.
16. Gasparyan AY, Ayvazyan L, Mikhailidis DP, Kitas GD. Mean platelet volume: a link between thrombosis and inflammation? Curr Pharm Des. 2011;17(1):47-58. Epub 2011/01/21.
17. Akboga MK, Canpolat U, Yuksel M, Yayla C, Yilmaz S, Turak O, et al. Platelet to lymphocyte ratio as a novel indicator of inflammation is correlated with the severity of metabolic syndrome: A single center large-scale study. Platelets. 2016;27(2):178-83. Epub 2015/07/22.
18. Çakıroğlu Y, Vural F, Vural B. The inflammatory markers in polycystic ovary syndrome: association with obesity and IVF outcomes. J Endocrinol Invest. 2016;39(8):899-907. Epub 2016/03/17.
19. Sezgin B, Kinci MF, Pirinççi F, Camuzcuoğlu A, Erel Ö, Neşelioğlu S, et al. Thiol-disulfide status of patients with cervical cancer. Journal of Obstetrics and Gynaecology Research. 2020;46(11):2423-9.
20. Kwon HC, Kim SH, Oh SY, Lee S, Lee JH, Choi HJ, et al. Clinical significance of preoperative neutrophil-lymphocyte versus platelet-lymphocyte ratio in patients with operable colorectal cancer. Biomarkers. 2012;17(3):216-22. Epub 2012/03/20.
21. Smith RA, Bosonnet L, Raraty M, Sutton R, Neoptolemos JP, Campbell F, et al. Preoperative platelet-lymphocyte ratio is an independent significant prognostic marker in resected pancreatic ductal adenocarcinoma. Am J Surg. 2009;197(4):466-72. Epub 2008/07/22.
22. Tola EN. The association between in vitro fertilization outcome and the inflammatory markers of complete blood count among nonobese unexplained infertile couples. Taiwan J Obstet Gynecol. 2018;57(2):289-94. Epub 2018/04/21.
23. Fornari MC, Sarto A, Berardi VE, Martínez MA, Rocha MG, Pasqualini S, et al. Effect of ovaric hyper-stimulation on blood lymphocyte subpopulations, cytokines, leptin and nitrite among patients with unexplained infertility. Am J Reprod Immunol. 2002;48(6):394-403. Epub 2003/02/28.
24. Spritzer PM, Lecke SB, Satler F, Morsch DM. Adipose tissue dysfunction, adipokines, and low-grade chronic inflammation in polycystic ovary syndrome. Reproduction. 2015;149(5):R219-R27.
25. Keskin Kurt R, Okyay AG, Hakverdi AU, Gungoren A, Dolapcioglu KS, Karateke A, et al. The effect of obesity on inflammatory markers in patients with PCOS: a BMI-matched case-control study. Arch Gynecol Obstet. 2014;290(2):315-9. Epub 2014/03/20.
26. Berbic M, Fraser IS. Regulatory T cells and other leukocytes in the pathogenesis of endometriosis. J Reprod Immunol. 2011;88(2):149-55. Epub 2011/01/29.
27. Tikhonchuk EY, Asaturova A, Adamyan L. Research Center of Obstetrics, Gynecology, and Perinatology, Ministry of Health of Russia, Moscow 117997, Ac. Oparina str. 4, Russia.
28. Jing X, Li C, Sun J, Peng J, Dou Y, Xu X, et al. Systemic inflammatory response markers associated with infertility and endometrioma or uterine leiomyoma in endometriosis. Therapeutics and Clinical Risk Management. 2020:403-12.
29. Karli P, Ozdemir AZ, Gulumser C. Do inflammation and hormone parameters have effects on IVF results in patients with unexplained infertility? Annals of Medical Research. 2019;26(7):1363-8.
30. Tola EN. The association between in vitro fertilization outcome and the inflammatory markers of complete blood count among nonobese unexplained infertile couples. Taiwanese Journal of Obstetrics and Gynecology. 2018;57(2):289-94.
31. Spritzer PM, Lecke SB, Satler F, Morsch DM. Adipose tissue dysfunction, adipokines, and low-grade chronic inflammation in polycystic ovary syndrome. Reproduction. 2015;149(5):R219-27. Epub 2015/01/30.
32. Herishanu Y, Rogowski O, Polliack A, Marilus R. Leukocytosis in obese individuals: possible link in patients with unexplained persistent neutrophilia. Eur J Haematol. 2006;76(6):516-20. Epub 2006/05/16.
33. Madan JC, Davis JM, Craig WY, Collins M, Allan W, Quinn R, et al. Maternal obesity and markers of inflammation in pregnancy. Cytokine. 2009;47(1):61-4. Epub 2009/06/10.
34. Balta S, Ozturk C. The platelet-lymphocyte ratio: A simple, inexpensive and rapid prognostic marker for cardiovascular events. Platelets. 2015;26(7):680-1. Epub 2014/12/31.
35. Horikawa T, Nakagawa K, Nakashima A, Ohgi S, Saito T, Saito H. Is high-sensitivity CRP useful as a predictor of fecundity? Fertility and Sterility. 2008;90:S226.
36. Tasdemir N, Sahin A, Celik C, Abali R, Guzel S, Uzunlar O, et al. Evaluation of human chaperonin 10 and high-sensitivity C-reactive protein levels of infertile women who underwent ovulation induction and intra-uterine insemination. J Obstet Gynaecol. 2015;35(7):707-10. Epub 2014/12/30.

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Comparison of SIRI and other inflammatory index parameters in patients diagnosed with preterm premature rupture of membranes with healthy pregnant women

Preterm prematür membran rüptürü tanısı alan hastalarda SIRI ve diğer inflamatuar indeks parametrelerinin sağlıklı gebelerle karşılaştırılması

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ABSTRACT

Aim: To investigate the relationship between subclinical inflammatory indices such as Systemic Inflammatory Response Index (SIRI) and Systemic Inflammatory Index (SII), which are known to be closely associated with inflammation and preterm premature rupture of membranes (PPROM).

Materials and Methods: Between November 2022 and November 2023, 150 singleton pregnant women admitted to the Perinatology Clinic with a diagnosis of preterm premature rupture of membranes between 24 and 37 weeks of gestation and 150 healthy singleton pregnant women of similar gestational age admitted to the clinic were included in the study. Laboratory results of the patients at the time of presentation to the clinic were taken as reference. Their records were evaluated retrospectively from the records.

Results: There were no statistically significant differences in maternal age, gravidity, parity (p: 0.082; p: 0.034; p:0.235 respectively). However abortion rates were different between the case and control groups (p<0.001). Body Mass İndex (BMI), birth weight, Apgar score at 1 minute, and Apgar score at 5 minutes were lower in the PPROM group than in the control group (p<0,01). Primary C/S rate was higher in PPROM group (p<0.001). Higher leukocyte, neutrophil, neutrophil to lymphocyte ratio (NLR), Platelet to lymphocyte ratio (PLR), systemic inflammatory response index (SIRI) and Systemic immune-inflammation index (SII) levels were observed in the PPROM group than in the control group (p<0.005). There was no diferences between Hb values of the groups (p=0.545).

Conclusion: According to these findings, SII, SIRI, NLR and PLR screening will be usefull for potential PPROM before membrane rupture occurs.

Keywords: Preterm premature rupture of membranes, inflammatory indices, Systemic Inflammatory Response Index

ÖZ

Amaç: İnflamasyon ile yakından ilişkili olduğu bilinen Sistemik İnflamatuar Yanıt İndeksi (SİRİ) ve Sistemik İnflamatuar İndeks (Sİİ) gibi subklinik inflamatuar indeksler ile preterm prematür membran rüptürü arasındaki ilişkiyi araştırmaktır.

Gereç ve Yöntemler: Kasım 2022 ile Kasım 2023 tarihleri arasında Perinatoloji Kliniğine başvuran, 24 ila 37. gebelik haftalarında preterm prematür membran rüptürü tanısı alan 150 tekil gebe ve kliniğe başvuran benzer haftalarda sağlıklı 150 tekil gebe çalışmaya dahil edildi. Hastaların kliniğe başvuru zamanına ait laboratuvar sonuçları referans alındı. Kayıtlar retrospektif olarak değerlendirildi.

Bulgular: Maternal yaş, gravide, parite açısından istatistiksel olarak anlamlı bir fark yoktu (sırasıyla p: 0.082; p: 0.034; p: 0.235). Ancak abortus oranları vaka ve kontrol grupları arasında farklıydı (p<0.001). VKİ, doğum ağırlığı, 1. dakika Apgar skoru ve 5. dakika Apgar skoru preterm prematür membran rüptürü grubunda kontrol grubuna göre daha düşüktü (p<0,01). Primer C/S oranı preterm prematür membran rüptürü grubunda daha yüksekti (p<0,001). Preterm prematür membran rüptürü grubunda kontrol grubuna göre daha yüksek lökosit, nötrofil, Nötrofil Lenfosit Oranı (NLR), Platelet Lenfosit Oranı (PLR), Sistemik İnflamatuar Yanıt İndeksi (SIRI) ve Sistemik İmmün-inflamasyon indeksi (SII) düzeyleri gözlendi (p<0,005). Grupların hemoglobin değerleri arasında fark bulunmamıştır (p=0,545).

Sonuç: Bu bulgulara göre, SII, SIRI, NLR ve PLR indeksleri membran rüptürü oluşmadan önce preterm prematür membran rüptürü öngörüsünde yararlı olacaktır.

Anahtar Kelimeler: Preterm prematür membran rüptürü, inflamatuar indeks, Sistemik İnflamatuar Yanıt İndeksi

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INTRODUCTION

Premature rupture of membranes (PROM) is the rupture of the fetal membranes at least one hour before the onset of labor. If PROM occurs before 37 weeks of gestation, it is called preterm premature rupture of membranes (PPROM). Although PPROM and PROM are similar in terms of etiology, complications and outcomes, infection in the choriodesidual region is thought to be the main cause of membrane rupture in PPROM. PPROM occurs in approximately 3% of pregnancies (1,2).

Management of PPROM is one of the most controversial issues. Many factors such as correct diagnosis, appropriate management and intervention, correct use of tocolytics, antibiotic prophylaxis and their duration of administration, antenatal corticosteroid administration and timing, testing methods to be used for infection and delivery decision should be managed appropriately and at the right time. The diagnosis of rupture of membranes can made by direct visualization of the arrival of amniotic fluid or, in suspected cases, after confirmation by placental alpha microglobulin-1 (PAMG-1) testing (3-5).

Once the diagnosis of PPROM is confirmed, maternal or fetal indications for emergency delivery should be sought. The most urgent indications are cord prolapse and bradycardia due to compression and chorioamnionitis. Treatment varies between emergency delivery and follow-up depending on the maternal and fetal condition. Gestational age, concomitant medical and obstetric complications, infection, presence of meconium, positive vaginal culture, non-reactive NST, variable decelerations, cervical maturity and presentation should be considered when deciding on the treatment procedure (6-8).

Although there is an association between preterm labor and infection, these two findings are not always seen together. In the literature, it has been shown that if subclinical infection is detected, these patients are resistant to treatment and will often result in preterm delivery. There are studies showing a significant association between PPROM and various inflammatory factors. There are easily measurable, reproducible, noninvasive, inexpensive and guiding markers for the determination of inflammation by complete blood count (CBC) which is a simple and inexpensive method and contains important parameters used in the diagnosis of many diseases. Inflammatory markers in CBC have been shown to reflect disease activity (9-11).

The aim of this study was to investigate the relationship between subclinical inflammatory factors such as, Systemic Inflammatory Response Index (SIRI) and Systemic Inflammatory Index (SII), which are known to be closely associated with inflammation, and PPROM.

MATERIAL METHOD

This retrospective case-control study was conducted in the Department of Perinatology, Ministry of Health, Etlik City Hospital in Ankara. The protocol of this study was approved by the Ethics Committee of the hospital. The study was conducted based on the universal ethical principles of the Declaration of Helsinki.

Between November 2022 and November 2023, 150 singleton pregnant women admitted to the Perinatology Clinic with a diagnosis of preterm premature rupture of membranes between 24 and 37 weeks of gestation and 150 healthy singleton pregnant women of similar gestational age admitted to the clinic were included in the study. Laboratory results of the patients at the time of presentation to the clinic were taken as reference. Inclusion criterias were being between the ages of 18-45, singleton pregnancy, being diagnosed with PPROM, being in the low risk group in 1st trimester aneuploidy screening and no structural anomaly was detected in the ultrasonographic anomaly scan performed between 18-22 weeks. Study participants with multiple pregnancy, maternal illness, fetal congenital and chromosomal abnormalities, chronic drug use, alcohol and smoking, additional pregnancy complications such as preeeclampsia during follow-up and those who have been treated with tocolytics were excluded from the study. Cases whose data could not be accessed, who delivered at another hospital, and who had additional pregnancy complications were also excluded from the study.

PPROM was diagnosed by placental alpha microglobulin-1 (PAMG-1) test or direct amniotic flow in speculum examination. As case group; 150 cases who met the inclusoin criteria and as control group 150 age and gestational week matched healthy pregnant women were included in the study.

Data such as maternal age, height, weight, number of pregnancies, history of previous pregnancies, last menstrual period, history of previous operations, history of systemic diseases, and biochemistry parameters in whole blood analyzed at the week of delivery, neonatal intensive care unit admission, 1 and 5. minute Apgar scores, birth weights were taken from the records.

Systemic Inflammatory Index (SII): neutrophil count × platelet count/lymphocyte count, Systemic Inflammatory Response Index (SIRI): monocyte count × neutrophil count/lymphocyte count were obtained from the hemogram values, and the indices were calculated according to the formulas.

The study was a retrospective study. The distribution of variables was determined using the Kolmogorov-Smirnov method. Because of continuous variables did not fit the normal distribution, Mann-

Whitney U test was applied. Chi-square test was applied for comparison of proportions. For correlation evaluation, Spearman or Pearson correlation test applied depending on whether it fits the normal distribution or not. Numerical variables were expressed as median (min-max). P value <0.05 was considered statistically significant.

RESULTS

The demographic and clinical characteristics and perinatal outcomes of the study groups are summarized in Table 1. There were no statistically significant differences in maternal age and parity (p: 0.082; p:0.235 respectively). However abortion rates and gravidity were different between the case and control groups (p<0.001, p: 0.034; respectively). BMI, birth weight, Apgar score at 1 minute, and Apgar score at 5 minutes were lower in the PPROM group than in the control group (p=0.009; p<0.001; p<0.001; p<0.001 respectively).

Comparison of CBC and systemic inflammatory indices between groups is shown in Table 2. Higher leukocyte, neutrophil, NLR, PLR, SIRI and SII levels were observed in the PPROM group than in the control group (p<0.001; p<0.001, p<0.001, p: 0.005; p<0.001, p<0.001 respectively). There was no diferences between Hb values of the groups (p=0.545). Therefore, statistically significant differences were also found in the CBC parameters such as count of lymphocytes, monocytes, platelets between the two groups (p<0.001; p: 0.007; p<0.001, p p<0.001, p<0.001 respectively).

Table 1. The demographic and clinical characteristics and perinatal outcomes of the study groups

	PPROM Median (Min-Max)	Control Median (Min-Max)	P value
Maternal Age	28 (14-44)	26 (17-42)	0,082
Gravidity	2 (1-8)	2 (1-8)	0,034
Parity	1 (0-5)	1 (0-4)	0,235
Abortion Rates	0 (0-4)	1 (0-5)	<0.001
BMI	29 (19-49)	28 (18-45)	0,009
Birth Weight (gr)	2300 (526-3670)	3240 (1720-4390)	<0,001
Apgar Score 1 min	8 (0-9)	9 (4-9)	<0,001
Apgar Score 5 min	9 (0-10)	10 (6-10)	<0,001

PPROM: preterm premature rupture of membranes, BMI: Body Mass Index, p value <0,05 is statistically significant

Table 2. Comparison of CBC and systemic inflammatory indices between groups

	PPROM	Control	P value
Leukocyte count	9790 (4570-16650)	240 (117-533)	<0.001
neutrophil count	10700 (880-14300)	6945 (610-15020)	<0.001
Lymphocytes count	1260 (860-2470)	1905 (850-8800)	<0.001
monocytes count	635 (39-1460)	3900 (411-27350)	0.007
Platelets count	360000 (237000-475000)	235500 (124000-465000)	<0.001
NLR	3,62 (0,38-17,67)	2,7 (0,56-4,73)	<0.001
PLR	126,7 (20,0-330,1)	100 (90-161)	<0.005
SIRI	2,26(0,97-11,7)	4,39 (1,02-44,8)	<0.001
SII	1900 (406-2900)	846,48 (148-1958)	<0.005
Hb (gr/dl)	11.7 (7-15.9)	11.7 (8-15)	0:545

CBC: Complete Blood Count, NLR: Neutrophil/Lymphosit ratio, PLR: Platelet/Lymphosit ratio, SIRI: Systemic Inflammatory Response Index, SII: Systemic Inflammatory Index, Hb: Hemoglobin, p<0.05 is statistically significant

DISCUSSION

Although various factors have been proposed in the pathogenesis of PPROM, infection or inflammation is an important cause of preterm labor (9-11). Recognizing and eliminating maternal infection is of great importance to reduce preterm deliveries and to prevent neonatal consequences of prematurity. A number of markers have been studied for the investigation and early and non-invasive recognition of maternal infection and inflammatory status. Such as those of soluble intercellular adhesion molecule-1, interleukin-6, matrix metalloproteinase-9, tissue inhibitor of metalloproteinases-1, angiopoietin-2, and insulin-like growth factor binding protein-2, which are not used much in routine examinations but can be used to predict chorioamnionitis [4,5]. Therefore, an easy, cheap, and routine early diagnostic test for PPROM is needed.

There are studies on the prognostic and predictive value of inflammation and related biomarkers such as NLR and PLR in many diseases (12-14). In response to inflammation, as neutrophil count increases, lymphocyte count decreases, thus NLR can be used as a marker of inflammation. High NLR values have been reported in pregnancy-related intrahepatic cholestasis, hyperemesis gravidarum and preeclampsia (15-17). Although NLR is useful, it is a nonspecific parameter. It may increase in many pregnancy-related conditions. In inflammatory conditions, activation in platelets is accompanied by a decrease in lymphocyte count (18,19). Accordingly, it has been reported that increased PLR values may be used in the recognition of the disease and prediction of prognosis in many inflammation-related diseases (20-22). Ekin et al. (23) reported an increase in first trimester platelet count and a decrease in MPV levels in patients with PPROM. SII index is a parameter indicating inflammation and immune status calculated by using neutrophil/lymphocyte as well as platelet values. Tanaçan et al. reported that SII and platelet counts were associated with adverse maternal and neonatal events in PPROM cases. They emphasized that platelets play a role in immune regulation and have extra importance compared to neutrophils by playing a role in placental remodelling especially in pregnant women (20). In our study, SII indices, platelet counts and PLR and NLR ratios were found to be higher compared to the control group. However in some studies, no correlation was found between PLR and PPROM.

CONCLUSION

According to these findings, SII, SIRI, NLR and PLR screening will be usefull for potential PPROM before membrane rupture occurs. Predicting PPROM and possible complications may provide opportunities for early intervention and treatment options. In addition, although the place of these and similar indexes in the literature is not clear, this study is expected to contribute to this point. The results should be supported by other prospective, multicenter and large sample studies.

REFERENCES

1. Kumar D, Moore RM, Mercer BM, Mansour JM, Redline RW, Moore JJ: The physiology of fetal membrane weakening and rupture: Insights gained from the determination of physical properties revisited. Placenta. 2016, 42:59-73.
2. Simhan HN, Canavan TP. Preterm premature rupture of membranes: diagnosis, evaluation and management strategies. BJOG 2005; 112: 32-7
3. Williamson M, Dong S, D'Souza R, Brignardello-Petersen R, Ronzoni S. Outpatient versus inpatient management of preterm prelabor rupture of membranes: A systematic review and meta-analysis. Acta Obstet Gynecol Scand 2024 Jul 1.
4. Martinez-Portilla RJ, Hawkins-Villarreal A, Alvarez-Ponce P, Chinolla-Arellano ZL, Moreno-Espinosa AL, Sandoval-Mejia AL, Moreno-Uribe N: Maternal serum interleukin-6: A non-invasive predictor of histological chorioamnionitis in women with preterm-prelabor rupture of membranes. Fetal Diagn Ther. 2019, 45:168- 75. 6.
5. Park JW, Park KH, Kook SY, Jung YM, Kim YM: Immune biomarkers in maternal plasma to identify histologic chorioamnionitis in women with preterm labor. Arch Gynecol Obstet. 2019, 299:725-32.
6. Mercer BM. Preterm premature rupture of the membranes: Current approaches to evaluation and management. Obstet Gynecol Clin North Am 2005; 32: 411–428.
7. Mercer BM, Crouse DT, Goldenberg RL et al. The antibiotic treatment of PPROM study: Systemic maternal and fetal markers and perinatal outcomes. Am J Obstet Gynecol 2012; 206: 145.e1–145.e9.
8. Ramsey PS, Lieman JM, Brumfield CG, Carlo W. Chorioamnionitis increases neonatal morbidity in pregnancies complicated by preterm premature rupture of membranes. Am J Obstet Gynecol 2005; 192: 1162–1166.
9. Romero R, Espinoza J, Gonçalves LF, Kusanovic JP, Friel L, Hassan S. The role of inflammation and infection in preterm birth. Semin Reprod Med 2007; 25: 21-39.
10. Isık H, Aynıoglu O, Sahbaz A et al. Can plateletcrit, an underestimated platelet parameter, be related with preterm labour? J Obstet Gynaecol 2015; 35: 676-80. 6.
11. Gioia S, Piazze J, Anceschi MM et al. Mean platelet volume: association with adverse neonatal outcome. Platelets 2007; 18: 284-8.
12. Sari I, Sunbul M, Mammadov C et al. Relation of neutrophil-to-lymphocyte and platelet-tolymphocyte ratio with coronary artery disease severity in patients undergoing coronary angiography. Kardiol Pol 2015; 73: 1310-6. 16. Seçkin KD,
13. Karslı MF, Yücel B et al. Neutrophil lymphocyte ratio, platelet lymphocyte ratio and mean platelet volume; which one is more predictive in the diagnosis of pelvic inflammatory disease? Gynecology Obstetrics & Reproductive Medicine 2015; 21: 150-4.
14. Ying HQ, Deng QW, He BS et al. The prognostic value of preoperative NLR, d-NLR, PLR and LMR for predicting clinical outcome in surgical colorectal cancer patients. Med Oncol 2014; 31: 305.
15. Ginekol Pol 2014; 85: 589-93. 20. Kirbas A, Biberoglu E, Daglar K et al. Neutrophilto-lymphocyte ratio as a diagnostic marker of intrahepatic cholestasis of pregnancy. Eur J Obstet Gynecol Reprod Biol 2014; 180: 12-5. 21.
16. Kurt RK, Güler A, Silfeler DB, Ozçil MD, Karateke A, Hakverdi AU. Relation of inflammatory markers with both presence and severity of hyperemesis gravidarum.
17. Kurtoglu E, Kokcu A, Celik H, Tosun M, Malatyalioglu E. May ratio of neutrophil to lymphocyte be useful in predicting the risk of developing preeclampsia? A pilot study. J Matern Fetal Neonatal Med 2015; 28: 97-9.

18. Akboga MK, Canpolat U, Yuksel M et al. Platelet to lymphocyte ratio as a novel indicator of inflammation is correlated with the severity of metabolic syndrome: A single center large-scale study. Platelets 2016; 27: 178-83.

19. Ozel A, Alici Davutoglu E, Yurtkal A, Madazli R. How do platelet-to-lymphocyte ratio and neutrophil-to-lymphocyte ratio change in women with preterm premature rupture of membranes, and threaten preterm labour? J Obstet Gynaecol 2020; 40: 195-9.

20. Tanacan A, Uyanik E, Unal C, Beksac MS. A cutoff value for systemic immune-inflammation index in the prediction of adverse neonatal outcomes in preterm premature rupture of the membranes. J Obstet Gynaecol Res 2020; 46: 1333-41.

21. Balta S, Ozturk C. The platelet-lymphocyte ratio: A simple, inexpensive and rapid prognostic marker for cardiovascular events. Platelets 2015; 26: 680- 1.

22. Nording HM, Seizer P, Langer HF. Platelets in inflammation and atherogenesis. Front Immunol 2015; 6: 98.

23. Ekin A, Gezer C, Kulhan G, Avcı ME, Taner CE. Can platelet count and mean platelet volume during the first trimester of pregnancy predict preterm premature rupture of membranes? J Obstet Gynaecol Res 2015; 41: 23-8.

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Serebroplasental Doppler oran ile fetal distress arasındaki ilişki: obstetrik sonuçların değerlendirilmesi

The relationship between cerebroplacental Doppler ratio and fetal distress: evaluation of obstetric outcomes

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ÖZ

Amaç: Bu çalışmanın amacı, Serebroplasental Doppler Oranı (CPR) ile fetal distress ve düşük doğum ağırlığı (DDA) arasındaki ilişkiyi incelemektir. Çalışmada CPR'nin fetal distressi öngörmedeki etkinliği ve klinik uygulamalardaki önemi değerlendirildi.

Gereç ve Yöntemler: Kasım 2015-Mayıs 2016 tarihleri arasında, doğum eylemi sırasında fetal distress riski taşıyan 93 gebe üzerinde bir prospektif çalışma yapıldı. Katılımcıların demografik ve obstetrik özellikleri, CPR değerleri ve diğer Doppler parametreleri (orta serebral arter (MCA) S/D oranı, umbilikal arter (UA) S/D oranı, PI ve RI) değerlendirildi. CPR'nin <5. persentil, 5-50. persentil ve >50. persentil dilimlerindeki değerleri ile fetal distress ve DDA gelişimi arasındaki ilişki analiz edildi.

Bulgular: Çalışmamızda, CPR'nin <5. persentildeki değerlerinin hem akut fetal distress (AFD) hem de DDA gelişimi ile anlamlı derecede ilişkili olduğu bulunmuştur. Ayrıca, MCA S/D oranı, AFD gelişimini öngörmede önemli bir parametre olarak tespit edilmiştir. UA doppler parametreleri, özellikle UA S/D oranı ve PI değerleri, DDA gelişimi ile anlamlı bir ilişki göstermiştir. CPR'nin >50. persentildeki değerlerinin ise hem AFD hem de DDA gelişme riskini azalttığı gözlemlenmiştir.

Sonuç: CPR, fetal distress ve DDA gibi olumsuz perinatal sonuçları öngörmede önemli bir parametre olarak ortaya çıkmaktadır. Ancak, CPR'nin tek başına yeterli olmayabileceği ve diğer Doppler parametreleri ile birlikte değerlendirilmesi gerektiği sonucuna varılmıştır. Gelecekteki çalışmalarda, CPR'nin klinik kullanımını optimize etmek için kombine yaklaşımlar önerilmektedir.

Anahtar Kelimeler: Serebroplasental Doppler oranı, fetal distress, düşük doğum ağırlığı, Doppler ultrasonografi, yüksek riskli gebelik

ABSTRACT

Aim: The aim of this study is to investigate the relationship between the Cerebroplacental Doppler Ratio (CPR) and fetal distress and low birth weight (LBW). The study evaluates the effectiveness of CPR in predicting fetal distress and its significance in clinical practice.

Materials and Methods: A prospective study was conducted on 93 pregnant women at risk of fetal distress during labor between November 2015 and May 2016. The demographic and obstetric characteristics of the participants, CPR values, and other Doppler parameters (MCA S/D ratio, UA S/D ratio, PI, and RI) were assessed. The relationship between the CPR values in the <5th percentile, 5th-50th percentile, and >50th percentile with the development of fetal distress and LBW was analyzed.

Results: In our study, CPR values in the <5th percentile were significantly associated with both acute fetal distress (AFD) and LBW. Additionally, the MCA S/D ratio was identified as an important parameter in predicting AFD. UA Doppler parameters, particularly the UA S/D ratio and PI values, showed a significant relationship with the development of LBW. It was observed that CPR values in the >50th percentile reduced the risk of both AFD and LBW.

Conclusion: The Cerebroplacental Doppler Ratio (CPR) emerges as an important parameter in predicting adverse perinatal outcomes such as fetal distress and LBW. However, it was concluded that CPR alone might not be sufficient and should be evaluated in conjunction with other Doppler parameters. Combined approaches are recommended in future studies to optimize the clinical use of CPR.

Keywords: Cerebroplacental Doppler ratio, fetal distress, low birth weight, Doppler ultrasonography, high-risk pregnancy

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GİRİŞ

Antenatal dönemde fetal iyilik halinin değerlendirilmesi, intrauterin fetal mortalite ve morbiditenin önlenmesi açısından son derece önemlidir (1). Obstetrik uygulamalarda sıkça kullanılan Non-Stres Test (NST), biyofizik profil, Doppler ultrasonografi ve fetal anatominin ultrasonografi ile incelenmesi gibi yöntemler, fetal sağlığın izlenmesinde kritik bir rol oynamaktadır (2,3). Ancak, bu yöntemlerin hiçbiri tek başına yeterli bilgi sağlamadığından, sıklıkla bir arada değerlendirilmesi gerekmektedir. Bu durum, obstetrik alanında Doppler ultrasonografinin giderek daha fazla kullanılmasına yol açmıştır (4,5).

Doppler ultrasonografi, feto-maternal dolaşımın non-invaziv bir şekilde değerlendirilmesine olanak tanıyan bir tekniktir. Doppler etkisi ilk kez Avusturyalı fizikçi Johann Christian Doppler tarafından tariflenmiş olup (6), tıbbi alanda ise Japon fizikçi Shigeo Satomura tarafından kullanılmıştır (7). Bu teknik, 1970'li yıllarda renkli Doppler sonografinin geliştirilmesiyle birlikte, obstetrik alanda yaygınlaşmıştır. Leandre Pourcelot, bu dönemde intrakraniyal arterlerin patolojilerini inceleyen çalışmalar yapmış ve Doppler sonografinin önemini vurgulamıştır (8). Doppler sonografinin obstetride kullanımı ile ilgili ilk çalışmalar, Fitzgerald ve Drumm tarafından 1977 yılında yayımlanmıştır (9).

Günümüzde, serebroplasental doppler oranı (CPR), kötü perinatal sonuçları öngörmede önemli bir belirteç olarak ortaya çıkmıştır (10,11). CPR, orta serebral arter (MCA) pulsatilite indeksinin (PI), umbilikal arter (UA) PI değerine bölünmesiyle hesaplanmaktadır. Fetal hipoksi ve plasental direncin arttığı durumlarda, MCA PI değerinin düşmesi ve UA PI değerinin artması sonucu CPR oranı azalır. Bu durum, fetal distressin erken dönemde tespit edilmesine olanak tanır (12,13).

Fetal distress, doğum sırasında fetüsün sağlığını tehdit eden bir durumdur ve acil müdahale gerektirebilir. Bu nedenle, fetal distressi önceden tahmin edebilecek güvenilir yöntemlerin geliştirilmesi, perinatal sonuçların iyileştirilmesi açısından büyük önem taşımaktadır. CPR, bu bağlamda, fetal distressi öngörmede kullanılan non-invaziv bir yöntem olarak dikkat çekmektedir (14). Ancak, CPR'nin bu rolü ne ölçüde yerine getirebildiği konusunda literatürde farklı görüşler bulunmaktadır.

Bu çalışmada, doğum eylemi sırasında fetal distress açısından risk taşıyan gebelerde, sonografik olarak ölçülen fetal CPR fetal distressi öngörmedeki etkinliği incelenmiştir. Çalışmanın amacı, CPR'nin doğum sürecinde fetal distressi tahmin etme yeteneğini değerlendirmek ve bu verileri diğer Doppler parametreleri ile karşılaştırarak sonuçlara ulaşmaktır. Literatürdeki mevcut bulgulara dayanarak, CPR'nin tek başına fetal distressi öngörmede yeterli bir belirteç olup olmadığını tartışacağız.

GEREÇ VE YÖNTEMLER

Bu çalışma, Kasım 2015 ile Mayıs 2016 tarihleri arasında Etlik Zübeyde Hanım Kadın Hastalıkları ve Doğum Eğitim ve Araştırma Hastanesi Riskli Gebelik Servisi'ne başvuran ve doğum eylemi sırasında fetal distress riski taşıyan 93 gebe üzerinde gerçekleştirilmiştir. Çalışmaya 37 gebelik haftası üstünde olan, oligohidramnios, günaşımı, non-reaktif NST gibi bulgular nedeniyle oksitosin yükleme testi (OXT) yapılmış ve bu testin hemen öncesinde fetal CPR sonografik olarak ölçülen hastalar çalışmaya dahil edilmiştir. 37 gebelik haftası altında olan hastalar, OXT yapılmamış hastalar ve OXT testi öncesinde fetal CPR sonografik olarak ölçülmeyen hastalar çalışma dışında bırakılmıştır. Çalışmaya Etlik Zübeyde Hanım Eğitim ve Araştırma Hastanesi etik kurulundan 27.06.2016 tarih 209 sayı numarası ile onay alındı.

Çalışmaya katılan hastaların yaşları, vücut kitle indeksi, gravida ve parite sayıları gibi demografik özellikleri kayıt altına alınmıştır. Ayrıca, hastaların obstetrik öyküleri, doğum ağırlıkları, Apgar skorları ve yenidoğan özellikleri de analiz edilmiştir. Fetal değerlendirmeler, Voluson PRO 730 ultrason cihazı kullanılarak yapılmış ve fetus sayısı, intrauterin situsu, habitusu, fetal kardiyak aktivite gibi parametreler gözlemlenmiştir. Bunun yanı sıra, Biparietal Diameter (BPD), Occipitofrontal Diameter (OFD), Head Circumference (HC), Abdominal Circumference (AC) ve Femur Length (FL) ölçümleri alınarak Hadlock formülüne göre tahmini fetal ağırlık hesaplanmıştır. Major fetal anomali ve fetal makrozomi ekarte edildikten sonra, amnion mayi miktarı değerlendirilmiş ve Rutherford ve ark. (15) tarafından tanımlanan kriterlere göre oligohidramnios olup olmadığı belirlenmiştir.

Doppler Ölçümleri

Fetal hareket yokluğunda ve apne periyodunda, insonasyon açısı mümkün olduğunca 0›a yakın olacak şekilde alındı ve maksimum 20 dereceye kadar düzeltme yapıldı. Renkli pulsed wave Doppler kullanılarak ölçümler yapılmıştır. MCA ve UA Doppler parametreleri olarak Sistolik/Diastolik oran (S/D), Pulsatilite İndeksi (PI) ve Rezistans İndeksi (RI) değerleri üç kez ölçülmüş ve bu ölçümlerin ortalamaları kaydedilmiştir. CPR değeri, MCA PI ortalamasının UA PI ortalamasına bölünmesiyle hesaplanmıştır. CPR persentil değerleri, http://medicinafetalbarcelona.org/calc/ adresinden hesaplanarak belirlenmiş ve CPR'nin 5. persentilin altında olan değerleri patolojik olarak kabul edilmiştir.

Oksitosin Yükleme Testi ve Doğum Sonrası Değerlendirme

OXT sonuçları, belirlenmiş kriterlere göre negatif, pozitif, belirsiz-kuşkulu, belirsiz-hiperstimülasyon ve yetersiz olarak sınıflandırılmıştır. OXT (+) olan hastalar akut fetal distress (AFD) tanısıyla sezaryen ile doğurtulmuş, OXT (-) olan hastalar ise normal

spontan vajinal yol (NSVY) ile doğum yapmışlardır. Doğum sonrası yenidoğanların doğum ağırlığı, 1. ve 5. dakika Apgar skorları, yenidoğan yoğun bakım ihtiyacı, mekonyum varlığı ve intrauterin gelişme geriliği (IUGR) durumu kayıt altına alınmıştır. Doğum ağırlığı ve doğum haftası, Lubchenco Eğrisi (16) kullanılarak değerlendirilmiş ve 10. persentilin altındaki bebekler düşük doğum ağırlığı (DDA) olarak kabul edilmiştir.

İstatistiksel Analizler

Çalışmada elde edilen veriler, SPSS 18.0 paket programı kullanılarak analiz edilmiştir. Tanımlayıcı istatistikler (yüzde, ortalama, ortanca, standart sapma) hesaplanmış ve verilerin karşılaştırılmasında Independent Samples T Testi kullanılmıştır. Değişkenlerin normal dağılıma uygunluğu Kolmogorov-Smirnov testi ile kontrol edilmiştir. CPR'nin AFD'yi predikte etmedeki başarısı ROC eğrisi kullanılarak değerlendirilmiş ve sonuçlar %95 güven aralığında, $p<0.05$ anlamlılık düzeyinde ele alınmıştır.

BULGULAR

Çalışamaya dahil edilen 93 gebenin ortalama yaşı 26.46 ± 5.43 yıl olarak bulunmuş olup, hastaların önemli bir kısmı normalin üzerinde kiloya sahipti. Gravida ve parite oranları incelendiğinde, hastaların çoğunluğunun nullipar olduğu görülmektedir. Yüksek riskli gebeleri içeren çalışmamızda sezaryen oranı %32.2 idi (Tablo 1).

CPR'nin farklı persentil dilimlerinde AFD ve DDA gelişim riskini değerlendirmiştir. <5. persentilde yer alan CPR değerleri, AFD gelişen grupta anlamlı derecede yüksek %30 olup, AFD gelişmeyen gruptaki %10.4'e kıyasla istatistiksel olarak anlamlı bir fark göstermiştir (p=0.03). Benzer şekilde, DDA gelişen grupta da <5. persentildeki CPR değerleri %25 oranında bulunmuş ve bu oran, DDA gelişmeyen gruptaki %7.8'e kıyasla anlamlı bir fark göstermiştir (p=0.02). Buna karşılık, >50. persentildeki CPR değerleri, hem AFD hem de DDA gelişme riskini azaltmış, bu grupta anlamlı bir fark tespit edilmiştir (sırasıyla p=0.01 ve p=0.04). Bu bulgular, düşük CPR değerlerinin hem AFD hem de DDA gelişimi ile güçlü bir şekilde ilişkili olduğunu göstermektedir (Tablo 2).

MCA ve UA doppler parametrelerinin değerlendirilmesi, fetal hemodinamik durumu anlamak için kritik öneme sahiptir. Bu çalışmada, MCA S/D oranı, MCA PI ve UA PI değerlerinin ortalamaları normal sınırlar içinde yer alırken, AFD gelişen olgularda MCA S/D oranının anlamlı olarak daha düşük olduğu tespit edilmiştir. Bu bulgu, AFD gelişimini öngörmede MCA S/D oranının önemli bir parametre olduğunu göstermektedir (Tablo 3).

Tablo 1. Hastaların Demografik ve Obstetrik Özellikleri

Özellik	Min-Max	Ort ± SD
Yaş (yıl)	17 - 40	26.46 ± 5.43
Vücut Kitle İndeksi	18.5 - 35.6	29.02 ± 4.20
Gravida (sayı)	1 - 9	1.5 ± 1.1
Parite (sayı)	0 - 3	0.8 ± 0.9
Doğum Haftası (hafta)	37.0 - 41.5	39.0 ± 1.2
Sezaryen Oranı (%)	-	32.2%

VKİ: Vücut Kitle İndeksi; Ort: Ortalama; SD: Standart Sapma

Tablo 2. CPR Değerlerinin AFD ve DDA ile İlişkisi

CPR Persentil	AFD (+) n (%)	AFD (-) n (%)	p Değeri	DDA (+) n (%)	DDA (-) n (%)	p Değeri
<5. persentil	3 (30%)	7 (10.4%)	0.03	4 (25%)	6 (7.8%)	0.02
5-50. persentil	10 (47.6%)	25 (37.3%)	0.12	7 (43.8%)	28 (36.4%)	0.10
>50. persentil	8 (22.4%)	35 (52.3%)	0.01	5 (31.2%)	43 (55.8%)	0.04

CPR: Serebroplasental Doppler Oranı; AFD: Akut Fetal Distres; DDA: Düşük Doğum Ağırlığı

Tablo 3. MCA ve UA Doppler Parametrelerinin Değerlendirilmesi

Parametre	Min - Max	Ort ± SD
MCA S/D Oranı	2.47 - 7.53	4.09 ± 0.98
MCA PI	0.94 - 1.91	1.45 ± 0.22
MCA RI	0.58 - 0.84	0.73 ± 0.06
UA S/D Oranı	1.76 - 4.35	2.33 ± 0.43
UA PI	0.58 - 1.58	0.84 ± 0.17
UA RI	0.43 - 0.76	0.56 ± 0.06

MCA: Orta Serebral Arter; UA: Umbilikal Arter; S/D Oranı: Sistolik/Diastolik Oran; PI: Pulsatilite İndeksi; RI: Rezistans İndeksi

Tablo 4. Akut Fetal Distres Gelişen ve Gelişmeyen Olguların Doppler Parametreleri

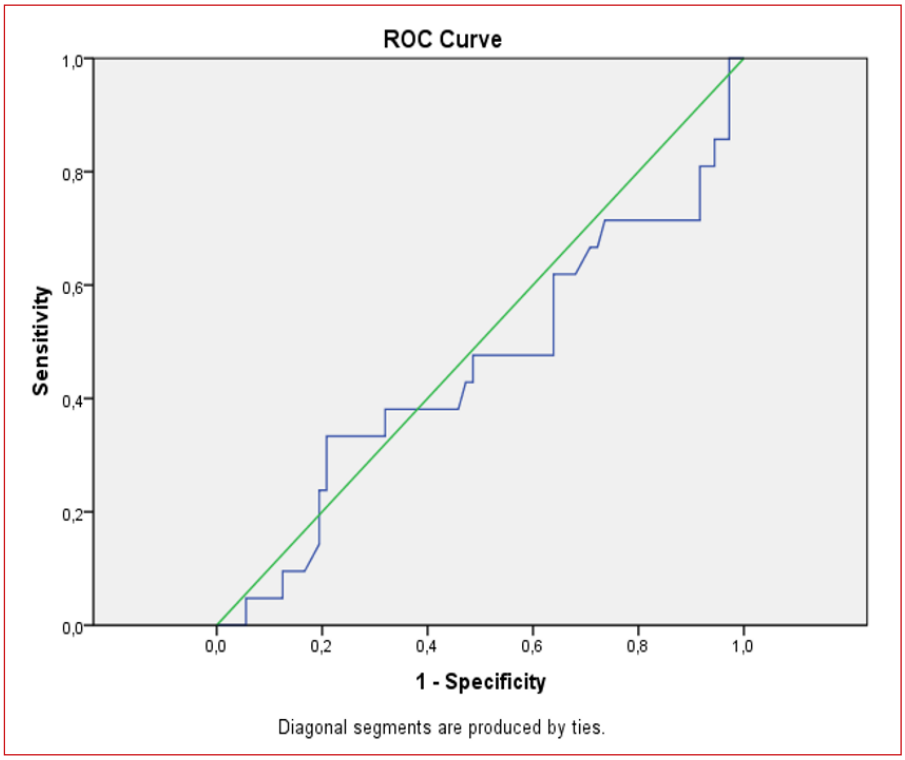
Parametre	AFD (+) (n=21)	AFD (-) (n=72)	p Değeri
MCA S/D Oranı	3.72 ± 0.72	4.20 ± 1.02	0.046
MCA PI	1.40 ± 0.22	1.46 ± 0.22	0.309
UA S/D Oranı	2.32 ± 0.54	2.32 ± 0.38	0.998
UA PI	0.85 ± 0.21	0.84 ± 0.15	0.824
CPR Değeri	1.72 ± 0.40	1.81 ± 0.39	0.379
CPR Persentil	42.95 ± 3.09	43.19 ± 2.72	0.972

MCA: Orta Serebral Arter; UA: Umbilikal Arter; S/D Oranı: Sistolik/Diastolik Oran; PI: Pulsatilite İndeksi; CPR: Serebroplasental Doppler Oranı; AFD: Akut Fetal Distres

Tablo 5. Düşük Doğum Ağırlığı Olan ve Olmayan Yenidoğanların Doppler Parametreleri

Parametre	DDA (+) (n=16)	DDA (-) (n=77)	p Değeri
MCA S/D Oranı	4.52 ± 1.37	4.00 ± 0.86	0.053
UA S/D Oranı	2.61 ± 0.62	2.26 ± 0.34	0.003
UA PI	0.94 ± 0.23	0.82 ± 0.15	0.009
UA RI	0.59 ± 0.07	0.55 ± 0.06	0.006
CPR Değeri	1.60 ± 0.39	1.83 ± 0.39	0.034
CPR Persentil	29.12 ± 2.80	46.05 ± 2.82	0.027

MCA: Orta Serebral Arter; UA: Umbilikal Arter; S/D Oranı: Sistolik/Diastolik Oran; PI: Pulsatilite İndeksi; RI: Rezistans İndeksi; CPR: Serebroplasental Doppler Oranı; DDA: Düşük Doğum Ağırlığı



Şekil 1. Serebroplasental oran / Akut fetal distress (CPR/AFD) ROC eğrisi

Çalışmamızda, AFD gelişen ve gelişmeyen olguların Doppler parametreleri karşılaştırılmıştır. AFD gelişen grupta, MCA S/D oranı (p=0.046) istatistiksel olarak anlamlı derecede düşük bulunmuştur, bu da MCA S/D oranının AFD'yi öngörmede önemli bir gösterge olduğunu göstermektedir. Bununla birlikte, diğer parametrelerde; MCA PI (p=0.309), UA S/D oranı (p=0.998), UA PI (p=0.824), CPR değeri (p=0.379) ve CPR persentil değerlerinde (p=0.972) gruplar arasında istatistiksel olarak anlamlı bir fark bulunmamıştır. Bu sonuçlar, MCA S/D oranının AFD gelişimini tahmin etmede diğer Doppler parametrelerinden daha belirgin bir role sahip olduğunu ortaya koymaktadır (Tablo 4).

Ayrıca, DDA gelişen ve gelişmeyen gruplar arasında UA ve MCA Doppler parametreleri çalışmamızda karşılaştırılmıştır (Tablo 5). DDA gelişen grupta, UA S/D oranı (p=0.003), UA PI (p=0.009) ve UA RI (p=0.006) değerleri, DDA gelişmeyen gruba göre anlamlı derecede yüksek bulunmuştur. Ayrıca, DDA gelişen grupta CPR değeri (p=0.034) ve CPR persentil değeri (p=0.027) de anlamlı derecede düşük bulunmuştur. Buna karşın, MCA S/D oranı (p=0.053) istatistiksel olarak anlamlı bir fark göstermemiştir. Bu bulgular, UA Doppler parametrelerinin ve düşük CPR değerlerinin, DDA gelişimini öngörmede önemli olabileceğini göstermektedir.

CPR'nin AFD'yi öngörmedeki başarısını değerlendirmek amacıyla yapılmıştır. Eğri altında kalan alan değeri (0.454) ve p=0.52 olması, CPR'nin AFD tanısında anlamlı bir belirteç olmadığını göstermektedir. Bu bulgu, CPR'nin tek başına AFD'yi öngörmede yeterli bir güvenilirliğe sahip olmadığını ortaya koymaktadır (Şekil 1).

TARTIŞMA

Bu çalışma, CPR ile fetal distress arasındaki ilişkiyi incelemeye odaklanmıştır. Elde edilen bulgular, CPR'nin, özellikle düşük değerlerinin, fetal distress ve DDA gibi olumsuz perinatal sonuçlarla ilişkili olduğunu göstermektedir. Bu sonuçlar, literatürde daha önce rapor edilen bulgularla uyumludur ve CPR'nin klinik kullanımında önemli bir yer tuttuğunu göstermektedir.

Çalışmamızda, CPR'nin <5. persentildeki değerlerinin, hem AFD hem de DDA gelişimi ile anlamlı derecede ilişkili olduğu saptanmıştır. Bu bulgu, Morales-Rosello ve ark. (11) tarafından yapılan çalışmada, düşük CPR değerlerinin IUGR ve fetal distress riskini artırdığı yönündeki sonuçları desteklemektedir. Ayrıca, Arbeille ve ark. (17) tarafından yapılan bir başka çalışma, CPR'nin fetal hipoksi ve plasental yetersizlik gibi durumları öngörmedeki etkinliğini vurgulamış, bu da çalışmamızdaki bulgularla örtüşmektedir.

Çalışmamızda ayrıca, MCA S/D oranının AFD gelişimini öngörmede önemli bir parametre olduğu bulunmuştur. MCA S/D oranının düşük olması, fetal hipoksiye işaret edebilir ve bu durum, fetal distressin gelişme riskini artırır. Benzer şekilde, Fitzgerald ve Drumm (9) MCA S/D oranının fetal hemodinamik değişiklikleri yansıttığını ve bu oranın fetal distressin erken tespitinde kullanılabileceğini belirtmişlerdir.

UA Doppler parametrelerinin, özellikle UA S/D oranı ve UA PI değerlerinin, DDA gelişimi ile olan ilişkisi de çalışmamızda vurgulanmıştır. Rutherford ve ark. (15) tarafından yapılan bir çalışmada, UA Doppler ölçümlerinin plasental yetmezliği ve fetal büyüme kısıtlılığını öngörmede kritik bir rol oynadığı belirtilmiştir. Çalışmamızdaki bulgular, bu sonuçlarla uyumlu olup, UA Doppler parametrelerinin DDA gelişimini öngörmedeki önemini vurgulamaktadır.

CPR'nin düşük olduğu durumlarda, fetal distressin gelişme riski artmaktadır. Bu nedenle, CPR'nin doğum eylemi sırasında düzenli olarak değerlendirilmesi, perinatal sonuçları iyileştirebilir. CPR'nin fetal iyilik hali değerlendirmesinde non-invaziv bir yöntem olarak kullanımı, obstetrik pratiğe önemli katkılar sunmaktadır. Pourcelot (8), Doppler sonografinin fetal dolaşımın non-invaziv değerlendirilmesindeki rolünü vurgulamış ve CPR'nin bu bağlamda kullanımı giderek yaygınlaşmıştır.

Çalışmamızın bulguları, CPR'nin düşük değerlerinin fetal distress ve DDA gelişimini öngörmede etkili olduğunu gösterirken, bu parametrenin tek başına yeterli olamayabileceği de unutulmamalıdır. CPR, diğer Doppler parametreleriyle birlikte değerlendirildiğinde, fetal distressin erken tespitinde daha yüksek bir doğruluk sağlayabilir. Literatürde, CPR'nin düşük değerlerinin fetal distress ve kötü perinatal sonuçlarla ilişkili olduğunu gösteren birçok çalışma mevcuttur. Ancak CPR'nin tek başına fetal distressi öngörmedeki yeterliliği konusunda bazı tartışmalar da bulunmaktadır. Örneğin, Morales-Rosello ve ark. (18), CPR'nin, diğer Doppler parametreleriyle birlikte değerlendirildiğinde, prediktif değerinin arttığını belirtmiştir. Çalışmamızda da CPR'nin, MCA ve UA Doppler parametreleriyle birlikte ele alınmasının, daha güvenilir bir değerlendirme sağladığı gözlemlenmiştir.

Bir diğer önemli bulgu ise, CPR'nin >50. persentil değerlerinin hem AFD hem de DDA gelişme riskini anlamlı derecede azalttığıdır. Bu durum, yüksek CPR değerlerinin fetal iyilik halinin bir göstergesi olduğunu ortaya koymaktadır. Benzer şekilde, Gramellini ve ark. (19) CPR'nin, normal ve patolojik gebelikler arasında ayrım yapmada etkili bir parametre olduğunu belirtmişlerdir.

CPR'nin klinik uygulamalardaki önemi, perinatal sonuçların iyileştirilmesine yönelik olarak daha fazla araştırmayı gerekli kılmaktadır. Çalışmamız, CPR'nin doğum eylemi sırasında fetal distressi öngörmede etkili bir araç olabileceğini göstermiştir. Ancak, MCA ve UA Doppler parametreleri gibi diğer hemodinamik göstergelerin de birlikte değerlendirilmesi, daha güvenilir sonuçlar elde edilmesini sağlayacaktır.

Nitekim, Figueras ve Gratacós (20), Doppler ultrasonografinin yüksek riskli gebeliklerde perinatal sonuçları iyileştirmede önemli bir rol oynadığını ve CPR'nin bu bağlamda değerli bir araç olduğunu belirtmişlerdir. Bununla birlikte, bu parametrelerin klinik kullanımı sırasında doktorların tecrübesi ve gebeliklerin bireysel özellikleri göz önünde bulundurulmalıdır.

Çalışmamızın bulguları, CPR'nin fetal distressi öngörmede önemli bir belirteç olduğunu doğrulamakla birlikte, bu parametrenin tek başına kullanımı yerine, kombine bir yaklaşımın benimsenmesi gerektiğini de ortaya koymaktadır. Bu doğrultuda, Williams ve ark. (21), CPR'nin diğer obstetrik göstergelerle birlikte değerlendirildiğinde, özellikle IUGR ve preeklampsi gibi durumların erken tespitinde daha etkili olduğunu vurgulamışlardır.

Sonuç olarak, bu çalışma, CPR'nin fetal distress ve DDA gelişimini öngörmede önemli bir parametre olduğunu ve obstetrik pratiğe değerli katkılar sağladığını göstermektedir. Ancak, CPR'nin diğer Doppler parametreleri ve klinik göstergelerle birlikte değerlendirilmesi, perinatal sonuçların iyileştirilmesinde daha büyük bir fayda sağlayabilir.

KAYNAKLAR

1. Eik-Nes SH, Marsal K, Brubaak AU, et al. Ultrasonic measurement of human fetal blood flow in aorta and umbilical vein: Influence of fetal breathing movements Adv. Ultrasound 1982;2: 233
2. Trudinger BJ, Fleischer AC, Romero R, Manning FA, et al. The Principles and Practice of Ultrasonography in obstetrics and Gynecology, Appleton and lange, Fourth ed. 1991;12: 173
3. Duck FA, Martin K: Trends in diagnostic ultrasound exposure. Phys. Med. Biol. 1991;36:1432
4. Kremkau FW: Doppler ultrasound: Principles and instruments. Philadelphia, WB Sounders 1990
5. Rotmensch S, Copel JA, Hobbins JC. Introduction to doppler velocimetry in obstetrics. Clinics of North America 1991;18: 4
6. Nicolaides KH, Rizzo G, Hecher K:Plasental and Fetal Doppler, 2000; Chapter 3.
7. Satamura S, Ultrasonic Doppler Method fort he inspection of cardiac functions. J.Acoust. Soc. Am. 1957; 29: 1181-1183
8. Pourcelot L, Applications Clinique de l'examen Doppler Transcutan. İn Pourcelot L (ed.) Velocimetric Ultrasonore Doppler. İserme Paris 1994
9. Fitzgerald DE, Drumm JE. Noninvaziv measurement of the Fetal circulation using ultrasound: A new method. Brit. Med. J.2 1977; 1450-1451
10. C A Vollgraff Heidweiller-Schreurs, M A De Boer 1, M W Heymans, L J Schoonmade, P M M Bossuyt, B W J Mol , C J M De Groot, C J Bax. Prognostic accuracy of cerebroplacental ratio and middle cerebral artery Doppler for adverse perinatal outcome: systematic review and meta-analysi. Itrasound Obstet Gynecol 2018 Mar;51(3):313-322. doi: 10.1002/uog.18809. Epub 2018 Feb 5.
11. Morales-Rosello J, Khalil A, Morlando M, Papageorghiou A, Bhide A, Thilaganathan B. Changes in fetal Doppler indices as a marker of failure to reach growth potential at term. Ultrasound Obstet Gynecol 2014;43:303-10
12. L Mecke, A Ignatov, A Redlich. The importance of the cerebroplacental ratio for the prognosis of neonatal outcome in AGA fetuses. Arch Gynecol Obstet 2023 Jan;307(1):311-317. doi: 10.1007/s00404-022-06596-z. Epub 2022 May 22.
13. Ahmed Abobakr Nassr, Ahmed M Abdelmagied, Sherif A M Shazly. Fetal cerebro-placental ratio and adverse perinatal outcome: systematic review and meta-analysis of the association and diagnostic performance. J Perinat Med. 2016 Mar;44(2):249-56. doi: 10.1515/jpm-2015-0274.
14. Greggory R DeVore. The importance of the cerebroplacental ratio in the evaluation of fetal well-being in SGA and AGA fetuses. Am J Obstet Gynecol. 2015 Jul;213(1):5-15. doi: 10.1016/j.ajog.2015.05.024.
15. Rutherford SE, Phelan PJ, Smith CV, Jacobs N. The four-quadrant assessment of amniotic fluid volume: An adjunct to antepartum fetal heart rate testing. Obstet Gynecol 1987;70:353
16. Lubchenco LO, Hansman C, Dressler M, Boyd E. Intrauterine growth as estimated from liveborn birth-weight data at 24 to 42 weeks of gestation. Pediatrics 1963;32:793-800
17. Arbeille P, Body G, Saliba E, et al. Fetal cerebral circulation assessment by Doppler ultrasound in normal and pathological pregnancies. Eur J Obstet Gynecol Reprod Biol 1988;29:261-73
18. Morales-Rosello J, Perales-Marín A, Ato-Escribano M, Munoz-Molina GM, Perez-Delboy A, Bajo-Arenas JM. Third trimester Doppler analysis: cerebroplacental ratio and birth weight prediction. J Matern Fetal Neonatal Med. 2012;25(12):2653-8.
19. Gramellini D, Folli MC, Raboni S, Vadora E, Merialdi A. Cerebral-umbilical Doppler ratio as a predictor of adverse perinatal outcome. Obstet Gynecol. 1992;79(3):416-20.
20. Figueras F, Gratacós E. An integrated approach to fetal growth restriction. Best Pract Res Clin Obstet Gynaecol. 2017;38:48-58.
21. Williams D, Craft N, Tailor A, Kurdi W, Bower S, Whitehead E. Doppler assessment of fetal growth restriction: changes in vessel pulsatility indices in relation to fetal growth restriction. Ultrasound Obstet Gynecol. 2013;41(4):413-9.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Comparison of surgical outcomes between manual free vaginal morcellation and no vaginal morcellation for uterine extraction during total laparoscopic hysterectomy: Retrospective cohort study

Total laparoskopik histerektomi sırasında uterus ekstraksiyonu için manuel serbest vajinal morselasyon ile vajinal morselasyon yapılmaması arasındaki cerrahi sonuçların karşılaştırılması: Retrospektif kohort çalışması

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ABSTRACT

Aim: We aimed to compare the surgical outcomes between manual free vaginal morcellation and no vaginal morcellation for uterine extraction during total laparoscopic hysterectomy (TLH) performed in a tertiary center.

Materials and Methods: A total of 397 TLH either with or without oophorectomy, for a benign indication, surgeries performed at our tertiary hospital between March 2022 and May 2024 were analyzed in our study. Patients who underwent manual free vaginal morcellation were defined as Group I (n=85, 21.4%) and patients who did not undergo vaginal morcellation were defined as Group II (n=312, 78.6%). Demographic characteristics, laboratory values, operation characteristics and histopathological reports were accessed from the hospital database.

Results: The median uterine weight of the morcellation group was greater. Median morcellation time was 9 minutes. While the median operation time of Group I was 80 minutes, it was 70 minutes for Group II (p<.01). The groups were similar with regard to postoperative urinary tract, intraoperative urinary tract and intraoperative bowel injuries. Intraoperative vaginal or perineal laceration was detected at a greater rate in the morcellation group.

Conclusion: For large uteruses, TLH is still the best option for suitable patients when performed by experienced surgeons. It has been revealed that manual free vaginal morcellation, performed without the need for additional incisions, is safe, low-cost and practical in total laparoscopic hysterectomies with benign indications.

Keywords: Hysterectomy, laparoscopy, large uteruses, morcellation

ÖZ

Amaç: Üçüncü basamak bir merkezde yapılan total laparoskopik histerektomi (TLH) sırasında uterus ekstraksiyonu için manuel serbest vajinal morselasyon ile vajinal morselasyon yapılmaması arasındaki cerrahi sonuçları karşılaştırmayı amaçladık.

Gereç ve Yöntemler: Üçüncü basamak hastanemizde Mart 2022 ile Mayıs 2024 tarihleri arasında benign endikasyonla ooferektomili veya ooferektomisiz toplam 397 TLH ameliyatı analiz edildi. Manuel serbest vajinal morselasyon yapılan hastalar Grup I (n=85, %21,4), vajinal morselasyon yapılmayan hastalar ise Grup II (n=312, %78,6) olarak tanımlandı. Hastane veri tabanından demografik özelliklere, laboratuvar değerlerine, operasyon özelliklerine ve histopatolojik raporlara ulaşıldı.

Bulgular: Morselasyon grubunun medyan uterus ağırlığı daha fazlaydı. Medyan morselasyon süresi 9 dakika idi. Grup I'in medyan ameliyat süresi 80 dakika iken Grup II'nin medyan operasyon süresi 70 dakikaydı (p<.01). Gruplar ameliyat sonrası üriner sistem, ameliyat sırasında üriner sistem ve ameliyat sırasında barsak yaralanmaları açısından benzerdi. Morselasyon grubunda intraoperatif vajinal veya perineal laserasyon daha fazla tespit edildi.

Sonuç: Büyük uteruslarda TLH, deneyimli cerrahlar tarafından yapıldığında uygun hastalar için hala en iyi seçenektir. Benign endikasyonlu total laparoskopik histerektomilerde ek kesi gerektirmeden yapılan manuel serbest vajinal morselasyonun güvenli, düşük maliyetli ve pratik olduğu ortaya çıktı.

Anahtar Kelimeler: Büyük uterus, histerektomi, laparoskopi, morselasyon

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INTRODUCTION

One of the most popular surgical procedures in gynecology is the hysterectomy, which is carried out using several techniques (1). Nowadays, laparoscopic hysterectomy (LH), a minimally invasive approach, has replaced vaginal and abdominal hysterectomy (2). Shorter hospital stays, quicker recuperation times, less discomfort, higher postoperative quality of life, less morbidity and mortality and more favorable cosmetic results compared to the open approach are all linked to laparoscopic surgery (3).

However, large uterine sizes may limit the surgeon's manipulation and visualization of the entire surgical field during laparoscopy. In a research by Bonilla et al. in 2007, it was reported that this restriction may increase intraoperative and postoperative complications (4). In 2014, Milad et al. stated that the rate of these complications will increase when morcellation of the uterus is required (5). The specimen can be extracted from the abdomen via mini-laparotomy, colpotomy, or vaginally by cold scalpel manual morcellation, with or without the tissue containment systems. Power morcellators can also be used during extraction with tissue containment systems in appropriately selected patients (6).

Although the minimally invasive surgical approach has many advantages over the open surgical approach, in 2017 the American Congress of Obstetricians and Gynecologists did not recommend LH in patients with large uteruses routinely (7) . It has been specifically stated that the best approach is for the gynecologist to discuss the procedure and complications with the patient in detail and make a common decision (7,8)

In 2021, Emery et al. evaluated the effect of uterine weight on operation complications and results in LH cases performed for benign indication (9). While it was stated that the large uterus group had longer operation time and more morcellation, it was emphasized that the complication rate did not increase with the advantages of minimally invasive surgery (9).

As mentioned above, there are conflicting results in the literature regarding LH and manual free vaginal morcellation for large uteruses. In our study, we aimed to compare the surgical outcomes between manual free vaginal morcellation and no vaginal morcellation for uterine extraction during total laparoscopic hysterectomy (TLH) performed in a tertiary center.

MATERIALS AND METHODS

This was a retrospective cohort study conducted at a tertiary center. Every individual person participating in this study gave their informed permission. The study was conducted in accordance with the Declaration of Helsinki's guiding principles. Institutional ethics committee approval was provided (Registration number: 2024/19-09; Date:29/05/2024).

A total of 397 TLH either with or without oophorectomy, for a benign indication, surgeries performed at our tertiary hospital between March 2022 and May 2024 were analyzed in our study. Patients who underwent manual free vaginal morcellation were defined as Group I (n=85, 21.4%) and patients who did not undergo vaginal morcellation were defined as Group II (n=312, 78.6%). Gynecological malignancies and concomitant surgical procedures were not included in the research. Demographic characteristics, laboratory values, operation characteristics and histopathological reports were accessed from the hospital database. All patients were routinely examined at a follow-up visit in the sixth postoperative week. Patients were questioned about possible complications.

The surgical technique involved a TLH that was standardized. The arms of the patients were positioned next to their bodies in the lithotomy posture. A urinary Foley catheter was inserted into the bladder at the beginning of the procedure. A Veress needle was used to produce pneumoperitoneum. Throughout the surgery, the intra-abdominal pressure was 12 mmHg. One 10 mm umbilical port was inserted for the optic laparoscope, and two 5 mm accessory ports were used for the standard laparoscopic instruments (lower right quadrant or upper left quadrant with left lower quadrant depending on primary surgeon preference). Depending on the patient's individual characteristics, the surgeon entered the abdomen through Palmer's point. To move the uterus during the dissection, a uterine manipulator (HOHL; Karl Storz, Tuttlingen, Germany) was utilized. The European Society for Gynecological Endoscopy established standards for the surgical procedures (10). When the surgeon could not remove a large uterus vaginally in one piece, surgeon preferably used the free manuel vaginal cold scalpel morcellation technique. Under camera visualization, the cervix is grabbed with a tenaculum and brought into the vagina. Breisky-Navratil vaginal retractors are used to provide exposure and protect the vaginal walls, rectum, and bladder. The morcellation procedure is performed within the vagina with a no. 10 scalpel and a wedge resection technique(8). Using the intracorporeal knots approach, multifilament absorbing running suture was used to stitch the vaginal cuff. Surgeons (MG and OY) who undertake routine surgery carried out all of the surgical operations. In case of urinary tract and bowel injuries, consultations were requested from the urology and general surgery surgeons.

Analyzes were performed with SPSS version 26.0 (IBM Inc., Chicago, IL, USA). Normality analysis was realized according to

the Kolmogorov-Smirnov test. Variables that did not show normal distribution were analyzed with the Mann-Whitney U test. These results were shown as median (minimum-maximum) numbers for each group. In the analysis of categorical data, Chi-square test and Fisher precision test were employed. These were presented as counts and percentages (%). The results were 95% confidence interval (CI). The p value taken statistically significant was <.05.

RESULTS

Comparison of demographic characteristics of groups were listed in Table 1. The age of all patients was between 34 and 85 years (median 49 years). The median age of Group I was 47 and Group II was 51 (p<.0001). The groups were similar in terms of body mass index (BMI) and subgroup BMI characteristics (p>.05). Gravidity, parity and previous abdominopelvic surgery did not differ between groups (p>.05). Previous cesarean section rate and nulliparity rate were statistically higher in the morcellation group (44.7% vs 32.3%, p=0.03; 36.5% vs 25%, p=.03, respectively). Although the rate of cardiopulmonary disease was found to be higher in Group II, the groups were alike (27.1% vs 37.5%, p=.07). Chronic pelvic discomfort was the most prevalent reason for surgery across the board for this group (43.6%). This was followed by abnormal uterine bleeding (33.8%) and benign adnexal mass (22.7%). Indication for abnormal uterine bleeding was similar between groups (27.1% vs 35.6%, p=.1). While chronic pelvic pain was greater in the morcellation group (p<.01), benign adnexal mass was greater in Group II (p<.01).

Comparison of laboratory, surgery and histopathological features of the groups were shown in Table 2. Bimanual uterine examination >12 weeks had a greater rate in each subgroup analysis in Group I (p<.05). The uterine weight of all patients ranged from 18 grams to 1253 grams (median 117 grams). The median uterine weight of the morcellation group was greater (320 grams vs 94.5 grams, p<.01). In the subgroup analysis of uterine weight > 250 grams, Group I was statistically significantly heavier in each subgroup (p<.05). Abdominal access via Palmer's point and conversion to laparotomy were similar between groups. Although preoperative hemoglobin and postoperative hemoglobin values were greater in Group II (p=.02; p=.01, respectively), the hemoglobin drop was not different among the groups (p=.3). On the other hand, the blood transfusion requirement rate was higher in Group I (8.2% vs 3.2%, p=.04). Morcellation time for Group I ranged from 1 to 17 minutes (median 9 minutes). The duration of all operations was between 30 and 200 minutes (median 70 minutes). While the median operation time (skin incision to skin closure) of Group I was 80 minutes, it was 70 minutes for Group II (p<.01). The groups were similar with regard to duration of hospitalization. Ultrasonographically confirmed

Table 1. Comparison of demographic characteristics of groups

Variables	All patients (n=397,100%)	Group I (n=85,21,4%)	Group II (n=312,78,6%)	p value
Age (years)	49 (34-85)	47 (37-65)	51 (34-85)	<0.01
BMI (kg/m²)	28.2 (17.2-41.7)	28.5 (18.8-41.7)	28.1 (17.2-41)	0.5
Subgroup of BMI (n,%) **<25 kg/m²** **25-30 kg/m²** **30-40 kg/m²** **>40 kg/m²**	 85 (21.4%) 177 (44.6%) 128 (32.2%) 7 (1.8%)	 18 (21.2%) 37 (43.5%) 26 (30.6%) 4 (4.7%)	 67 (21.5%) 140 (44.9%) 102 (32.7%) 3 (1%)	 0.1
Gravidy (n)	2 (0-13)	2 (0-5)	2 (0-13)	0.1
Parity (n)	2 (0-11)	2 (0-5)	2 (0-11)	0.1
Nulliparity (n,%)	109 (27.5%)	31 (36.5%)	78 (25%)	0.03
Previous abdominopelvic surgery (n)	0 (0-4)	0 (0-4)	0 (0-4)	0.1
Previous cesarean section (n,%)	138 (34.8%)	38 (44.7%)	100 (32.3%)	0.03
Cardiopulmonary disease (n,%)	140 (35.3%)	23 (27.1%)	117 (37.5%)	0.07
Indications (n,%) **Abnormal uterine bleeding** **Benign adnexal mass** **Chronic pelvic pain**	 134 (33.8%) 90 (22.7%) 173 (43.6%)	 23 (27.1%) 8 (9.4%) 54 (63.5%)	 111 (35.6%) 82 (26.3%) 119 (38.1%)	<0.01 0.1 <0.01 <0.01

BMI: Body mass index

Table 2. Comparison of laboratory, surgery and histopathological features of the groups

Variables	All patients (n=397,100%)	Group I (n=85,21,4%)	Group II (n=312,78,6%)	p value
Bimanual uterine examination (weeks) (n,%)				<0.01
<12 weeks	240 (60.5%)	0 (0%)	240 (76.9%)	<0.01
12-16 weeks	90 (22.7%)	27 (31.8%)	63 (20.2%)	0.02
16-20 weeks	44 (11.1%)	37 (43.5%)	7 (2.2%)	<0.01
20-24 weeks	23 (5.8%)	21 (24.7%)	2 (0.6)	<0.01
Uterus weight (grams)	117 (18-1253)	320 (95-924)	94.5 (18-1253)	<0.01
Subgroup weight of uterus (grams)				<0.01
<250 grams	315 (79.3%)	24 (28.2%)	291 (93.3%)	<0.01
250-500 grams	51 (12.8%)	35 (41.2%)	16 (5.1%)	<0.01
500-750 grams	26 (6.5%)	23 (17.1%)	3 (1%)	<0.01
>750 grams	5 (1.3%)	3 (3.5%)	2 (0.6%)	0.03
Palmer's point (n,%)	2 (0.5%)	0 (0%)	2 (0.6%)	0.4
Conversion to laparotomy (n,%)	9 (2.3%)	0 (0%)	9 (2.9%)	0.1
Preoperative hemoglobin (mg/dL)	12.6 (7.8-16)	12.4 (8.1-14.1)	12.7 (7.8-16)	0.02
Postoperative hemoglobin (mg/dL)	11.9 (6.9-13.7)	11.7 (6.9-13.7)	12 (7.1-15.1)	0.01
Hemoglobin drop (mg/dL)	0.6 (0.1-5.9)	0.7 (0.1-2.8)	0.6 (0.1-5.9)	0.3
Blood transfusion requirement (n,%)	17 (4.3%)	7 (8.2%)	10 (3.2%)	0.04
Operation time (minutes)	70 (30-200)	80 (35-200)	70 (30-200)	<0.01
Duration of hospitalization (days)	2 (1-21)	2 (1-21)	2 (1-14)	0.1
Intraoperative urinary tract injuries (n,%)	3 (0.8%)	2 (2.4%)	1 (0.3%)	0.05
Bladder injury	2 (0.5%)	1 (1.2%)	1 (0.3%)	0.3
Ureteral injury	1 (0.3%)	1 (1.2%)	0 (0%)	0.05
Intraoperative bowel injuries (n,%)	3 (0.8%)	0 (0%)	3 (1%)	0.3
Sigmoid colon	2 (0.5%)	0 (0%)	2 (0.6%)	0.4
Rectum	1 (0.3%)	0 (0%)	1 (0.4%)	0.6
Intraoperative vaginal or perineal laceration	13 (3.3%)	10 (11.8%)	3 (1%)	<0.01
Intraoperative transient hematuria	11 (2.8%)	10 (11.8%)	1 (0.3%)	<0.01
Postoperative urinary tract injuries (n,%)	3 (0.8%)	1 (1.2%)	2 (0.6%)	0.6
Bladder injury	1 (0.3%)	0 (0%)	1 (0.3%)	0.6
Ureteral injury	2 (0.6%)	1 (1.2%)	1 (0.3%)	0.6
Postoperative vaginal vault dehiscence (n,%)	4 (1%)	0 (0%)	4 (1.3%)	0.2
Postoperative surgical site infection (n,%)	3 (0.8%)	1 (1.2%)	2 (0.6%)	0.6
At least one myoma uteri (>4cm) (n,%)	32 (8.1%)	21 (24.7%)	11 (3.5%)	<0.01
Adenomyosis (n,%)	76 (19.1%)	29 (34.1%)	47 (15.1%)	<0.01

at least one myoma uteri (>4 cm) and histopathologically confirmed adenomyosis were at a greater rate in Group I (24.7% vs 3.5%, p<.01; 34.1% vs 15.1%, p<.01, respectively).

The groups were similar with regard to postoperative urinary tract, intraoperative urinary tract and intraoperative bowel injuries (p=.6; p=.05; p=.3; respectively). Intraoperative bladder injury was detected in one participant in the morcellation group. In the non-morcellation group, bladder injury was detected in one patient intraoperatively and one patient in the postoperative period. All bladder injuries detected occurred on the posterior wall of the bladder during vesicouterine dissection. Those detected intraoperatively were repaired laparoscopically, while those detected postoperatively were performed laparotomy. In the morcellation group, ureteral injuryiwas found in one participant intraoperatively and in one participant in the postoperative period,

while in the non-morcellation group, ureteraliinjury was observed in one participant in the postoperative period. In the morcellation group, a D-J ureteral stent was performed after laparoscopic extravesical ureteroneocystostomy for the full-thickness laceration detected intraoperatively in the left ureter. In both groups, patients who were diagnosed with a full-thickness laceration in the left ureter on the second postoperative day, first underwent nephrostomy, and then ureteroneocystostomy was performed via laparotomy at the third month. In the group without morcellation, two patients had a sigmoid colon injury and one patient had a rectum injury, which was detected intraoperatively. Sigmoid colon injuries occurred during extensive adhesiolysis. The rectum injury occurred while inserting a uterine manipulator. Primary repair of bowel injuries was performed via laparotomy. The surgery of six participants in the non-morcellation group was converted to laparotomy due to the presence of extensive adhesions. All nine patients who converted to laparotomy were in the non-morcellation group (0% vs 2.9%, p=.1). Intraoperative vaginal or perineal laceration was detected at a greater rate in the morcellation group (11.8% vs 1%, p<.01). Lacerations were primarily sutured. Vaginal vault dehiscence occurred between the 7th and 10th postoperative days. Repair of dehiscence was performed vaginally. Surgical site infection occurred between 24 and 48 hours postoperatively. Appropriate antibiotic therapy was prescribed.

DISCUSSION

In this current study, operation time was longer, intraoperative vaginal or perineal laceration and intraoperative transient hematuria complications were more common in the manual free vaginal morcellation group. Regarding other intraoperative or postoperative problems, the groups were comparable.

Numerous research examining various methods of morcellation have been published after the US Food and Drug Administration released their safety statement and cautionary notice regarding the application of laparoscopic power morcellators (11). In a retrospective cohort study, Meurs et al. compared power intraperitoneal morcellation, manual vaginal morcellation, and manual mini laparotomic morcellation after laparoscopic or robot-assisted LH or myomectomy with and without the use of an endoscopic bag (12). They discovered that there were no appreciable differences between the methods in terms of anticipated blood loss, duration of stay, or postoperative complications (12).

On the other hand, Raiomono et al. compared perioperative surgical results between contained and freexmanual vaginalxmorcellation of largexuteruses following TLH. They found that contained manual morcellation appeared to save operative time compared with free morcellation (11). It has been demonstrated that the use of a specimen retrieval bag surrounding the uterus during morcellation prevented sudden detachment of the tissues, regardless of their size, and allowed adequate mobilization. However, they did not evaluate morcellation time in their retrospective study (11). Additionally, they did not observe any differencexwith regard to intraoperative and postoperative complications between the groups (11).

Wang et al. compared patients with uterus size larger than 12 weeks but smaller than 16 weeks in two groups according to whether free manual morcellation was performed after TLH (13). While the uterus size was similar between the groups, the uterine weight was greater in the morcellation group. There were more patients with myoma uteri and adenomyoma in the morcellation group. The non-morcellation group had more intraoperative complications, longer operation time and longer uterine removal time. Conversion to laparotomy and postoperative complications were similar between groups (13).

In a meta-analysis, uterine weight >250 g, BMI ≥ 30 kg/m^2, previous surgery history, adhesions, comorbidity and advanced age were identified as factors associated with operation time, complications and conversion to laparatomy in LH surgeries (14).

Asgari et al. investigated the elements that predict the requirement forxmorcellation via transvaginal or mini-laparotomy in TLH (15). According to multiple modified Poisson regression analysis, uterine cross-sectional area >36.5 cm^2, uterine size >13 weeks, largest myoma uteri diamater >4 cm were associated with the specified morcellation types. Uterine length >10 cm was found to be unrelated (15).

In another study including patients underwent total laparoscopic due to malignant and benign indication, risk elements associated with perineal/vaginal lacerations and vaginal removal in TLH were examined (16). One significant risk factor for perineal or vaginal lacerations was a uterus transverse diameter of ≥5 cm in individuals with a normal-sized uterus, but interestingly, it was not in patients with large myomas (≥5 cm) (16).

In our study, the median age of the morcellation group was younger. BMI was similar between groups. Although parity did not vary among groups, the rate of nulliparity was greater in the morcellation group. It is thought that this situation increases the need for morcellation (16). Previous cesarean section history, which increases the risk of complications as stated in the literature (17), was greater in the morcellation group. Cardiopulmonary disease comorbidity prolongs the operation time and increases the risk of complications, both in terms of anesthesia and surgery. The groups are similar in this

feature. The uterine size >12 weeks had a greater rate in each subgroup analysis in Group I. The median uterine weight of the morcellation group was greater. In the subgroup analysis of uterine weight > 250 grams, Group I was statistically significantly heavier in each subgroup. The median operation time in the morcellation group was 10 minutes longer. Median morcellation time was 9 minutes. At least one myoma uteri (>4 cm) and adenomyosis were more common in the morcellation group. Intraoperative vaginal or perineal laceration and intraoperative transient hematuria were statistically greater in the morcellation group. Although conversion to laparotomy and postoperative complications were higher in the non-morcellation group, this difference was not statistically significant.

Urinary tract injuries following laparoscopic hysterectomy were evaluated in a systematic study, and the total risk for LH was 0.73%. The rates of ureteral and bladder injuries varied from 0.02% to 0.4% and 0.05% to 0.66%, respectively (18). Inan et al. reported the probability of lower urinaryitract injuryiduring TLH was 2.01% (17). In Llarena et al.'s review, the overall incidence of bowel injury in gynecological laparoscopy was reported as 0.1% (19). Factors such as enlarged uterus, endometriosis, comorbidity, extensive adhesions, and previous pelvic/abdominal surgery increase the risk of genitourinary and bowel injuries (19,20). The patients analyzed in our study were at high risk of complications in terms of demographic and surgical characteristics. Despite these risks, the rate of all urinary tract injuries, both intraoperative and postoperative, was 1.5% and rate of bowel injuries was 0.8% in the entire cohort. These rates are compatible with the literature. Additionally, these complications did not occur during morcellation.

The most important limitation of our study is its retrospective design. Another weakness is that uterine length, uterine size, number of myoma uteri, and location of myoma uteri cannot be included in the analysis. We think that these factors may affect the morcellation procedure. Its strength is that surgical procedures are managed in a multidisciplinary tertiary center with the same experienced surgical team, and that it provides incidental data on TLH operations, as it includes a large cohort, as well as evaluating the effectiveness of morcellation. Additionally, we would like to point out that the patients in our study had a high risk of complications.

CONCLUSION

For large uteruses, TLH is still the best option for suitable patients when performed by experienced surgeons. It has been revealed that manual free vaginal morcellation, performed without the need for additional incisions, is safe, low-cost and practical in total laparoscopic hysterectomies with benign indications. There is a need for prospective studies involving the cohort at high risk of complications, where measurement and mapping of myoma uteri and uterus are recorded in preoperative ultrasound evaluation.

Conflict of Interest
The authors have no conflicts of interest to declare.

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Authors' Contributions
Concept: O.Y., Design: O.Y. and M.G., Data Collection or Processing: K.A.M., A.H.K., B.D., Analysis or Interpretation: O.Y. and A.A., Literature Search: O.Y., A.A., K.A.M.,Writing: O.Y., U.A.

Ethical Statement
Ethical permission required for the study was obtained by Izmir Dokuz Eylul Univerisity Ethics Committee (Registration number: 2024/19-09; Date:29/05/2024).

REFERENCES

1. Orhan A, Ozerkan K, Kasapoglu I, Ocakoglu G, Cetinkaya Demir B, Gunaydin T, et al. Laparoscopic hysterectomy trends in challenging cases (1995-2018). J Gynecol Obstet Hum Reprod. 2019 Dec;48(10):791–8.
2. Stoller N, Wertli MM, Zaugg TM, Haynes AG, Chiolero A, Rodondi N, et al. Regional variation of hysterectomy for benign uterine diseases in Switzerland. PLoS One. 2020;15(5):e0233082.
3. Aarts JWM, Nieboer TE, Johnson N, Tavender E, Garry R, Mol BWJ, et al. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane database Syst Rev. 2015 Aug;2015(8):CD003677.
4. Bonilla DJ, Mains L, Whitaker R, Crawford B, Finan M, Magnus M. Uterine weight as a predictor of morbidity after a benign abdominal and total laparoscopic hysterectomy. J Reprod Med. 2007 Jun;52(6):490–8.
5. Milad MP, Milad EA. Laparoscopic morcellator-related complications. J Minim Invasive Gynecol. 2014;21(3):486–91.
6. ACOG Committee Opinion, Number 822: Uterine Morcellation for Presumed Leiomyomas. Obstet Gynecol. 2021 Mar;137(3):e63–74.
7. Committee Opinion No 701: Choosing the Route of Hysterectomy for Benign Disease. Obstet Gynecol. 2017 Jun;129(6):e155–9.
8. Donat LC, Clark M, Tower AM, Menderes G, Parkash V, Silasi DA, et al. Transvaginal morcellation. J Soc Laparoendosc Surg. 2015;19(2):1–8.
9. Lambat Emery S, Boulvain M, Petignat P, Dubuisson J. Operative Complications and Outcomes Comparing Small and Large Uterine Weight in Case of Laparoscopic Hysterectomy for a Benign Indication. Front Surg. 2021;8(October):1–6.
10. Nelson G, Altman AD, Nick A, Meyer LA, Ramirez PT, Achtari C, et al. Guidelines for pre- and intra-operative care in gynecologic/oncology surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations--Part I. Gynecol Oncol. 2016 Feb;140(2):313–22.
11. Raimondo D, Raffone A, Franceschini C, Virgilio A, Palermo R, Borghese G, et al. Comparison of perioperative surgical outcomes between contained and free manual vaginal morcellation of large uteruses following total laparoscopic hysterectomy. Int J Gynecol Obstet. 2024;164(3):1167–73.
12. Meurs EAIM, Brito LG, Ajao MO, Goggins ER, Vitonis AF, Einarsson JI, et al. Comparison of Morcellation Techniques at the Time of Laparoscopic Hysterectomy and Myomectomy. J Minim Invasive Gynecol. 2017;24(5):843–9.
13. Wang H, Li P, Li X, Gao L, Lu C, Zhao J, et al. Total laparoscopic hysterectomy in patients with large uteri: Comparison of uterine removal by transvaginal and uterine morcellation approaches. Biomed Res Int. 2016;2016:1–7.

14. Driessen SRC, Sandberg EM, la Chapelle CF, Twijnstra ARH, Rhemrev JPT, Jansen FW. Case-Mix Variables and Predictors for Outcomes of Laparoscopic Hysterectomy: A Systematic Review. J Minim Invasive Gynecol. 2016;23(3):317–30.

15. Asgari Z, Enzevaei A, Hosseini R, Behnia-Willison F. Predictive factors of the need to morcellate in total laparoscopic hysterectomy. Aust New Zeal J Obstet Gynaecol. 2021;61(5):759–64.

16. Chikazawa K, Imai K, Ko H, Ichi N, Misawa M, Kuwata T. Risk factors associated with perineal and vaginal lacerations and vaginal removal in total laparoscopic hysterectomy. Gynecol Minim Invasive Ther. 2022;11(3):150–4.

17. İnan AH, Budak A, Beyan E, Kanmaz AG. The incidence, causes, and management of lower urinary tract injury during total laparoscopic hysterectomy. J Gynecol Obstet Hum Reprod. 2019;48(1):45–9.

18. Adelman MR, Bardsley TR, Sharp HT. Urinary tract injuries in laparoscopic hysterectomy: a systematic review. J Minim Invasive Gynecol. 2014;21(4):558–66.

19. Llarena NC, Shah AB, Milad MP. Bowel injury in gynecologic laparoscopy: a systematic review. Obstet Gynecol. 2015 Jun;125(6):1407–17.

20. Thurston J, Murji A, Scattolon S, Wolfman W, Kives S, Sanders A, et al. No. 377-Hysterectomy for Benign Gynaecologic Indications. J Obstet Gynaecol Canada. 2019;41(4):543–57.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Analysis of the clinical features, treatment strategies, and results of borderline ovarian tumors

Borderline over tümörlerinin klinik özellikleri, tedavi stratejileri ve sonuçlarının analizi

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ABSTRACT

Aim: The objective of our study was to evaluate the preoperative circumstances, treatments, and postoperative states of patients at our university hospital.

Materials and Methods: This retrospective study used the Mersin University Hospital's gynecological oncology clinic database. Patient age, menopausal status, preoperative tumor markers, and preoperative ultrasonography features were collected from the hospital databases. After the initial procedure, information regarding the surgical method, histological classification, stage at the time of diagnosis, size of the tumor, status of the lymph nodes, and the ultimate pathological diagnosis were collected.

Results: This study has a cohort of 84 patients who underwent surgery between 2007 and 2023. The study groups had a median age of 41.5, ranging from 15 to 88. Out of the total patients, 71.4% were in the premenopausal stage. Final pathology revealed the presence of a malignant tumor in 10 patients, accounting for 11.9% of the total. Out of the total number of patients, six had serous tumors, while four had mucinous tumors. Out of the 83 people, a recurrence of the condition was found in 3, indicating a rate of 3.6%. The mean duration of progression-free survival for these individuals was 19 months. Only individuals in the early stage of the disease experienced a recurrence, and two exhibited micropapillary variants.

Conclusion: Ultimately, BOTs have a highly favorable prognosis. Patients who meet the criteria might consider undergoing fertility-preserving surgical procedures.

Keywords: Borderline ovarian tumors, ovarian cancer, gynecologic surgery

ÖZ

Amaç: Çalışmamızın amacı, üniversite hastanemizdeki hastaların ameliyat öncesi durumlarını, tedavilerini ve ameliyat sonrası durumlarını değerlendirmektir.

Gereç ve Yöntemler: Bu retrospektif çalışmada Mersin Üniversitesi Hastanesi jinekolojik onkoloji kliniği veri tabanı kullanıldı. Hasta yaşı, menopoz durumu, ameliyat öncesi tümör belirteçleri ve ameliyat öncesi ultrasonografi özellikleri hastane veri tabanlarından toplandı. İlk prosedürden sonra, cerrahi yöntem, histolojik sınıflandırma, tanı anındaki evre, tümörün boyutu, lenf nodlarının durumu ve nihai patolojik tanı ile ilgili bilgiler toplandı.

Bulgular: Bu çalışma 2007-2023 yılları arasında cerrahi uygulanan 84 hastadan oluşan bir kohortu içermektedir. Çalışma gruplarının ortanca yaşı 41,5 olup, 15 ile 88 arasında değişmektedir. Hastaların %71,4'ü premenopozal evredeydi. Nihai patoloji, hastaların %11,9'unu oluşturan 10 hastada malign tümör varlığını ortaya koymuştur. Toplam hasta sayısının altısında seröz tümör, dördünde ise müsinöz tümör vardı. 83 kişiden 3'ünde hastalığın nüks ettiği tespit edilmiş olup bu da %3,6'lık bir orana işaret etmektedir. Bu bireyler için ortalama progresyonsuz sağkalım süresi 19 aydı. Yalnızca hastalığın erken evresindeki bireylerde nüks görüldü ve ikisinde mikropapiller varyant göstermiştir.

Sonuç: Sonuç olarak, BOT'lar oldukça olumlu bir prognoza sahiptir. Kriterleri karşılayan hastalara fertilite koruyucu cerrahi prosedürler uygulanması düşünülebilir.

Anahtar Kelimeler: Borderline over tümörleri, over kanseri, jinekolojik cerrahi

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INTRODUCTION

Borderline ovarian tumor (BOT) was first described in 1929 as a semi-malignant ovarian tumor (1). Since the early 1970s, the World Health Organization (WHO) and the International Federation of Gynecology and Obstetrics (FIGO) have categorized BOT as a distinct group of ovarian tumors based on their appearance (specifically, the lack of invasion into surrounding tissue). BOT is characterized by moderate nuclear atypia and slightly increased mitotic activity but does not exhibit stromal invasion or rapid infiltrative growth (2).

Youthful women are diagnosed with them at an early stage and have a more favorable prognosis compared to malignant ovarian tumors (3). The 5-year survival rates range from 95% to 97%, with around 70% of these cancers being diagnosed in stage I (4). A thorough examination of the abdominal and pelvic cavities is necessary to accurately determine the stage of the disease and ensure its complete eradication. Surgical staging often involves several essential procedures, including cytologic washings, tumor resection, infracolic omentectomy, and peritoneal biopsies. It is not advisable to perform routine lymphadenectomy (5). While recurrences are higher in cases where the ovary is preserved, there is no significant adverse effect on survival. This is because the majority of recurrences are of the borderline type and can potentially be salvaged with surgical intervention (6,7).

This study aimed to describe and analyze the clinical characteristics, tumor histology, and treatment approaches for women diagnosed with BOT at Mersin University from 2007 to 2023.

MATERIALS AND METHODS

This retrospective analysis involved patients who were diagnosed with borderline ovarian tumors at the Department of Obstetrics and Gynecology, Mersin University Faculty of Medicine, from 2007 to 2023. The project received approval from our university's Clinical Research Ethics Committee (18/10/2023, approval number 2023/706). Pertinent information regarding the patient's age, menopausal state, preoperative tumor markers, and preoperative ultrasound features were acquired from hospital databases. After the pre-surgery, we collected data on the surgical method, histological classification, stage at the time of diagnosis, size of the tumor, lymph node condition, and ultimate pathological diagnosis. Gynecologic pathology specialists examined tissue samples. Furthermore, the study evaluated supplementary therapies, the duration of postoperative monitoring, and potential instances of relapse. It examined them for staging using the 2014 FIGO staging criteria. Patients with incomplete data were not included in the analysis.

The statistical studies were conducted using IBM SPSS Statistics 22 software developed by IBM et al. in the United States. The data distribution was assessed for normalcy using the Kolmogorov-Smirnov Test. The data were presented as percentages, mean ± standard deviation, and median. A significance level of $p \leq 0.05$ was used to determine statistical significance.

RESULTS

The mean age at diagnosis time was 42.29 ± 16.06 years, 71.4% of the patients were premenopausal. Histopathologically, 39 patients had serous (54.9%), 23 patients had mucinous (32.4%), five patients had seromucinous (7.0%), three patients had endometrioid (4.2%), and one patient had Brenner (1.4%) type BOT. Stage 1a was seen in 45 cases (53.6%), stage 1b in 1 case (1.2%), stage 1c in 36 cases (42.9%), stage 3a in 1 case and stage 3c disease in 1 case.

The median preoperative CA 125 value was 26 U/l (2-5842), 31 (36.9%) patients had high levels of CA 125 (35 U/mL). In individuals with serous pathology, the median CA 125 level was 31.5 U/mL, while in those with mucinous type, it was 20.5 U/mL. No statistically significant difference was observed between the two groups (p=0.379). The CA 125 level was significantly greater in nulliparous patients compared to multiparous ones (p=0.032).

The maximum tumor size was 8.89 ± 5.43 cm in the serous type, 15.17 ± 6.65 cm in the mucinous type, 7.58 ± 3.60 cm in the ceruminous type, and 4.63 ± 1.89 cm in the endometrioid type. Tumor size was significantly larger in nulliparous patients (p=0.012). When comparing premenopausal and postmenopausal individuals, no statistically significant difference was found between the two groups (p=0.196).

In unilateral tumors, 52.6% were serous, and 35.1% were mucinous histopathologic types. In bilateral tumors, 64.3% were serous, and 21.4% were mucinous. 87.0% of mucinous tumors were unilateral, whereas 23.1% of serous tumors were bilateral.

Positive peritoneal cytology was detected in 9 (16.7%) patients. High CA 125 levels were detected in 66.7% of patients with positive cytology results. There was no significant difference in CA 125 levels between the two groups, as indicated by a p-value of 0.546. Of the patients with positive cytology, 83.3% were serous, and 16.7% were mucinous histopathologic type.

Out of the 83 people, a recurrence of the condition was found in 3, indicating a rate of 3.6%. The mean duration of progression-free survival for these individuals was 19 months. Only individuals

Table 1. Demograghic and statistical characteristics of borderline ovarian tumors

Age	
Median (n, range in years)	41.5 (15-88)
≤ 40	39 (46.4%)
> 40	45 (53.6%)
Menopausal status (n,%)	
Premenopausal	60 (71.4%)
Postmenopausal	24 (28.6%)
Histology (n,%)	
Benign	3 (3.6%)
Malign	10 (11.9%)
Borderline	71 (84.5%)
Serous	39 (54.9%)
Mucinous	23 (32.4%)
Seromucinous	5 (7.0%)
Endometrioid	3 (4.2%)
Brenner	1 (1.4%)
Tumor markers (U/mL) Ca125	MEDİAN 26.0 2-5842 U/mL
Median size (range in cm)	10.00 (1-28)
Stage in diagnosis (n,%)	
1A	45 (53.6)
1B	1 (1.2)
1C	36 (42.9)
3A	1 (1.2)
3C	1 (1.2)
Surgery (n,%)	
Cyctectomy	30 (35.7%)
Bilateral cyctectomy	7 (8.3%)
Unilateral salpingo-oopherectomy (USO)	27 (32.1%)
Hysterectomy	40 (47.6%)
Omentectomy	6 (7.1%)
Pelvic lymph node dissection	23 (27.4%)
Paraaortic lymph node dissection	22(26.2%)
Appendectomy	25 (29.8%)
Treatment after recurrence Carpoplatine/paclitaxel combination	3 (3.6%)
Recurrence (n,%)	3 (3.6%)

in the early stage of the disease experienced a recurrence, and two exhibited micropapillary alterations. One patient experienced a recurrence in the opposite ovary after relapsing following oophorectomy, while the remaining patients experienced recurrence after cystectomy. The presence of micropapillary variations and the performance of cystectomy have been recognized as the most significant risk factors for the recurrence of the disease. The histological subtypes detected in the recurrences were serous and mucinous.

Patients who have advanced disease or have lost their ability to reproduce are treated with a comprehensive surgical procedure. This procedure includes cleaning the peritoneal cavity, removing the uterus and fallopian tubes, removing the ovaries, removing the fatty tissue in the lower abdomen, completely removing visible lesions in the peritoneum, or taking multiple tissue samples from the peritoneum. In cases of mucinous borderline ovarian tumors, patients also undergo an appendectomy. Unilateral salpingo-oophorectomy was performed in 27 patients, and cystectomy in 30 patients who wanted to preserve early-stage fertility.

DISCUSSION

This study involved a retrospective review of 84 individuals with BOT who underwent surgery at our clinic. The age distribution of patients diagnosed with BOTs exhibits significant variation across different studies, indicating a broad range of ages. Within a particular study, the average age at which the condition was diagnosed was 41.77 years, with the age range spanning from 19 to 84 years. The majority of patients, precisely 70%, were in the premenopausal stage (8). Another study reported a mean age of mean age 40 years , with patients ranging from 15 to 84 years, and noted that 71.1% of patients were premenopausal (9). A third study revealed that the average age of diagnosis was 40.6 years, with patients spanning from 17 to 78 years. Furthermore, 51.9% of instances were individuals under 40 years (10). In a larger cohort, the median age at initial diagnosis was 47 years, with a range from 13 to 85 years, and the age distribution was divided into three groups: 114 patients aged 13-39 years, 100 patients aged 40-50 years and 138 patients over 50 years (11). Finally, another study reported a mean age at diagnosis of 40.1 years, ranging from 14 to 80 years (12). Collectively, these studies suggest that although BOTs can occur at any age, they are most commonly diagnosed in women in their 40s, and a significant proportion of cases occur in young, premenopausal women. In our study, the median age of the patients was 41.5 years, ranging from 15 to 88 years. Similarly, in our study, most patients were in the premenopausal period.

The most common histopathological type of BOTs is serous, as consistently reported in multiple studies. In a study by J. Ren et al., serous histology was the most common, accounting for 101 of 234 cases (43.2%) (12). Similarly, another study found that serous BOTs accounted for 61.6% of cases (9). This trend is also supported by data showing that serous BOTs are the leading histological type in bilateral tumors, with 91% of such cases being serous (10). In addition, a study investigating the relationship between tumor markers, tumor size, and histopathology found that serous histopathology was more frequent in unilateral tumors (41.1%) and even in bilateral tumors (85.2%) (13). Another research paper confirmed these findings by reporting that serous BOTs accounted for 59.3% of cases in stage IA and 66.7% in stage IIIC, further

emphasizing its prevalence at different stages of the disease (8). These studies emphasize that serous histology is the most common type of BOT, followed by mucinous, and other types such as endometrioid, clear cell, and Brenner are significantly less frequent. Our study found the most common serous subtype and the second most common mucinous subtype.

CA 125 levels are an essential biomarker in the diagnosis and management of BOTs, with variations observed according to histopathology and tumor stage. A study analyzing CA 125 levels in patients with BOTs found that serous borderline ovarian tumors exhibited higher CA 125 levels than mucinous tumors, with a statistically significant difference (13). Specifically, mean CA 125 levels in serous histopathology were markedly elevated at 372.8 U/l, while mucinous tumors showed lower levels (13). In addition, the distribution of CA 125 levels varied according to the stage of the tumor. For example, in stage IA, 65.9% of patients had CA 125 levels below 35 U/mL, whereas in more advanced stages such as IIIC, 85.7% of patients had levels above 35 IU/ml, indicating a correlation between higher CA 125 levels and advanced disease stages (8). This trend underlines the utility of CA 125 as a marker for disease progression. The median CA 125 level of the patients in our study was 26. There was no significant difference between CA 125 levels when comparing histopathologic types (p=0.211).

In the study by Güngör et al., 80.3% of the patients were stage 1A (10). In a study by Güvenal et al. in 539 patients, 73.5% of the patients were found to be 1A (9). In our study, stage 1A was the most common stage with 53.6%.

In a study by Ren et al. investigating the factors affecting recurrence in patients with BOT, recurrence was found to be 16.8% in patients who underwent conservative surgery and 5.2% in patients who underwent radical surgery (12). In a single-center study conducted by Güngör et al. with 183 patients, the recurrence rate was 2.7%. In this study, adjuvant chemotherapy was administered to 8.1% of the patients. In the same study, 91 patients (49.7%) underwent comprehensive surgery, and USO was the most common fertility-preserving surgery. Unilateral cystectomy was performed in 15 patients (16.8%) (10). In the Turkish Gynecologic Oncology Group study by Güvenal et al. evaluating 539 patients, the recurrence rate was 5.4%. In the same study, the recurrence rate was 8.3% in patients who underwent conservative surgery and 3% in patients who underwent radical surgery (9). In a study by Ayhan et al. evaluating recurrence and prognostic factors in Borderline ovarian tumors, 13 of 100 patients received chemotherapy, and the recurrence rate was found to be 3% (8). Our study found the recurrence rate to be 3.6% and the rate of patients who received chemotherapy to be 3.6%. We thought that the low recurrence rate and the low number of patients who received chemotherapy may be due to the higher number of patients who underwent radical surgery compared to other studies. In our study, cystectomy was the most common procedure, and USO was the second most common procedure in patients who underwent fertility-preserving surgery.

In conclusion, BOTs have an excellent prognosis with low recurrence rates. Fertility-sparing surgery options should be considered for appropriate patients. Larger studies with well-staged patients are needed for the management of BOTs and treatment options.

REFERENCES

1. Taylor HC. Malignant and semimalignant tumors of the ovary. Surg Gynecol Obstet. 1929;48:204–30.
2. Morice P, Uzan C, Fauvet R, Gouy S, Duvillard P, Darai E. Borderline ovarian tumour: pathological diagnostic dilemma and risk factors for invasive or lethal recurrence. Lancet Oncol. 2012;13(3):e103–15.
3. Gershenson DM. Clinical management potential tumours of low malignancy. Best Pract Res Clin Obstet Gynaecol. 2002;16(4):513–27.
4. Tinelli R, Tinelli A, Tinelli FG, Cicinelli E, Malvasi A. Conservative surgery for borderline ovarian tumors: a review. Gynecol Oncol. 2006;100(1):185–91.
5. Gershenson DM. Management of borderline ovarian tumours. Best Pract Res Clin Obstet Gynaecol. 2017;41:49–59.
6. Fischerova D, Zikan M, Dundr P, Cibula D. Diagnosis, treatment, and follow-up of borderline ovarian tumors. Oncologist. 2012;17(12):1515–33.
7. Helpman L, Yaniv A, Beiner ME, Aviel-Ronen S, Perri T, Ben-Baruch G, et al. Fertility preservation in women with borderline ovarian tumors–how does it impact disease outcome? A cohort study. Acta Obstet Gynecol Scand. 2017;96(11):1300–6.
8. Ayhan A, Guven ESG, Guven S, Kucukali T. Recurrence and prognostic factors in borderline ovarian tumors. Gynecol Oncol. 2005;98(3):439–45.
9. Guvenal T, Dursun P, Hasdemir PS, Hanhan M, Guven S, Yetimalar H, et al. Effect of surgical staging on 539 patients with borderline ovarian tumors: a Turkish Gynecologic Oncology Group study. Gynecol Oncol. 2013;131(3):546–50.
10. Gungor T, Cetinkaya N, Yalcin H, Ozdal B, Ozgu E, Baser E, et al. Retrospective evaluation of borderline ovarian tumors: single center experience of 183 cases. Arch Gynecol Obstet. 2015;291:123–30.
11. Plett H, Harter P, Ataseven B, Heitz F, Prader S, Schneider S, et al. Fertility-sparing surgery and reproductive-outcomes in patients with borderline ovarian tumors. Gynecol Oncol. 2020;157(2):411–7.
12. Ren J, Peng Z, Yang K. A clinicopathologic multivariate analysis affecting recurrence of borderline ovarian tumors. Gynecol Oncol. 2008;110(2):162–7.
13. Sahin F, Aktürk E, Günkaya OS, Özdemir S, Konal M, Genç S, et al. Borderline ovarian tumors: twenty years of experience at a tertiary center. Anatolian Current Medical Journal. 2023;5(3):196–200.

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Analyzing quality of youtube videos about premature ovarian failure in the past decade

Geçtiğimiz on yılda prematür over yetmezliği ile ilgili youtube videolarının kalitesinin analizi

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ABSTRACT

Aim: To determine the quality of YouTube videos about premature ovarian failure (POF), and variations in quality of professional YouTube videos about POF.

Materials and Methods: The selected terms including 'POF', 'premature ovarian insufficiency', 'POF, infertility', 'POF, symptoms', 'POF, diagnosis', and 'POF treatment' were searched on YouTube. Totally, 100 videos each uploaded by professional and non-professional sources were included. Characteristics of videos were noted and quality of YouTube videos were analyzed according to Global Quality Score (GQS) and modified DISCERN scale. The two groups were compared in terms of video characteristics, GQS, and modified DISCERN score. Videos uploaded by professional sources were categorized into two different groups from the first 5 years and the last 5 years, and compared.

Results: The mean number of views was 2961 for professional videos and 2003 for non-professional videos (p= 0.006), and the mean duration of videos was 10 minutes for professional videos and 6 minutes for non-professional videos (p= 0.001). When professional videos in the last 10 years were evaluated, number of views and 'likes' were significantly higher in favor of professional videos between 2014-2018 (p= 0.033 vs. p= 0.037). Video duration was significantly shortened for videos between 2019-2023 (p= 0.002). Patients as the target audience dominated videos prepared in the last 5 years (p= 0.001). Professional videos had significantly higher GQS and modified DISCERN score (p= 0.001 for each parameter). Moreover, GQS and modified DISCERN scores of professional videos increased significantly in the last 5 years (p= 0.001 vs. p= 0.023).

Conclusions: Professional YouTube videos about POF had significantly higher quality and 'like' numbers, and the quality of professional YouTube videos about POF significantly increased in the last five years. The proportion of professional videos about POF being prepared for patients increased significantly in the last 5 years, but video length of professional videos significantly decreased.

Keywords: DISCERN score, GQS, premature ovarian failure, YouTube

ÖZ

Amaç: Prematür ovaryen yetmezlik (POF) ile ilgili YouTube videolarının kalitesini ve POF ile ilgili profesyonel YouTube videolarının kalitesindeki farklılıkları belirlemek.

Gereç ve Yöntemler: 'POF', ' prematür ovaryen yetmezlik', 'POF, infertilite', 'POF, semptomlar', 'POF, tanı' ve 'POF tedavisi' dahil olmak üzere seçilen terimler YouTube'da arandı. Profesyonel ve profesyonel olmayan kaynaklar tarafından yüklenen toplam 100 video dahil edildi. Videoların özellikleri not edildi ve YouTube videolarının kalitesi Global Kalite Puanı (GQS) ve modifiye DISCERN ölçeğine göre analiz edildi. İki grup video özellikleri, GQS ve modifiye DISCERN skoru açısından karşılaştırıldı. Profesyonel kaynaklar tarafından yüklenen videolar ilk 5 yıl ve son 5 yıl olmak üzere iki farklı gruba ayrılarak karşılaştırıldı.

Bulgular: Ortalama görüntülenme sayısı profesyonel videolar için 2961, profesyonel olmayan videolar için 2003 (p= 0,006) ve ortalama video süresi profesyonel videolar için 10 dakika, profesyonel olmayan videolar için 6 dakikaydı (p= 0,001). Son 10 yıldaki profesyonel videolar değerlendirildiğinde, görüntülenme ve 'beğeni' sayıları 2014-2018 yılları arasında profesyonel videolar lehine anlamlı derecede daha yüksekti (p= 0,033 vs. p= 0,037). Video süresi 2019-2023 yılları arasındaki videolar için anlamlı derecede kısaydı(p= 0,002). Hedef kitle olarak hastalar son 5 yılda hazırlanan videolarda baskındı (p= 0,001). Profesyonel videoların GQS ve modifiye DISCERN puanı anlamlı derecede daha yüksekti (her parametre için p= 0.001). Ayrıca, profesyonel videoların GQS ve modifiye DISCERN skorları son 5 yılda önemli ölçüde artmıştı (p= 0.001 vs. p= 0.023).

Sonuçlar: POF ile ilgili profesyonel YouTube videolarının kalitesi ve 'beğenme' sayıları önemli ölçüde daha yüksektir ve POF ile ilgili profesyonel YouTube videolarının kalitesi son beş yılda önemli ölçüde artmıştır. Hastalar için hazırlanan POF ile ilgili profesyonel videoların oranı son 5 yılda önemli ölçüde artmış ancak profesyonel videoların video uzunluğu önemli ölçüde azalmıştır.

Anahtar Kelimeler: DISCERN skoru, GQS, prematür ovaryan yetmezlik, YouTube

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BACKGROUND

Premature ovarian failure (POF) is one the most common causes of young female infertility and is characterized by cessation of ovarian functions including hormonal and germinative functions, hypergonadotropic hypogonadism, and amenorrhea in women under 40 years of age (1). Although clinical presentation of the disease and underlying pathology may differ for each case, previous reports demonstrated that the prevalence of POF is more than 1% for women under 40 years (2). Moreover, Jankowska stated that POF was detected at higher rates in regions with low human development indexes (3). Heterogeneity of POF with regards to patient symptoms and lack of awareness about POF may contribute to delayed diagnosis of the disease. In recent years, patients and their relatives increasingly consult internet resources regarding their symptoms, diseases and treatments (4).

YouTube is most preferred social media platform and more than 3 billion people from more than 120 countries watch YouTube videos. Free and easy access to YouTube videos, and the presence of numerous sources about any topic are the most important factors affecting this preference. Freeman and colleagues found that people pay more attention to visual sources than only audio or only written sources (5). Other side, YouTube does not have a mechanism to check the accuracy of uploaded videos. Yuksel and Cakmak analyzed the quality of YouTube videos about COVID-19 and pregnancy, and concluded that despite the high view rates, videos included much misleading information (6). In another study, Cetin and colleagues emphasized the low quality and insufficiency of YouTube videos about coronary artery bypass grafting. Moreover, Cetin et al. found that YouTube videos about coronary artery bypass grafting uploaded by professional healthcare providers had significantly better quality (7).

Although quality and reliability of YouTube videos were examined for many different diseases, to our knowledge, no study has focused on the quality of YouTube videos about POF. In the present study, the aim was to determine the quality of YouTube videos about POF, and variations in quality of professional YouTube videos about POF.

METHODS

The present study was conducted between January 1 and January 15, 2024. The selected terms including 'POF', 'premature ovarian insufficiency', 'POF, infertility', 'POF, symptoms', 'POF, diagnosis', and 'POF treatment' were searched on YouTube, and listed by relevance. While only videos uploaded to YouTube in the last 10 years were examined, 100 videos each uploaded by professional and non-professional sources were included in the study, and playlists were created for each group. Only videos with a duration of 1 to 15 minutes were included in the study. Videos which were uploaded by doctors and other healthcare providers, and healthcare institutes were accepted as professional videos, and videos shared by patients and patient relatives, and from new agencies were accepted as non-professional videos. Silent videos, videos with languages other than English, repetitive videos, videos with self-promotional content, and videos unrelated to the study were excluded from the study. Two experienced gynecologists evaluated all selected YouTube videos with regards to video characteristics.

YouTube video characteristics including 'view number', 'video duration', 'likes', 'dislikes', and 'comment number' were recorded. In addition, videos were categorized in two groups; professional health care providers or patients. Reliability and quality of YouTube videos were analyzed according to Global Quality Score (GQS) and modified DISCERN scale.

Global Quality Score (GQS) and Modified DISCERN Score

The GQS, which included five questions, evaluates the reliability and quality of video content. Each question on the scale is scored between 1 point and 5 points. A score of 5 shows the highest quality and reliability of visual content, and score of 1 indicates lowest quality and reliability (8). The modified DISCERN scale is a shortened 5-question version of the DISCERN questionnaire, and use of modified DISCERN scale in assessing visual contents was externally validated. Each inquiry on the modified DISCERN scale answered with 'no' is given zero points, and 'yes' is given one point. Five points show the highest quality and reliability of visual content (9).

In order to analyze the quality of YouTube videos about POF in the last ten years, YouTube videos were classified into two separate groups with 1:1 ratio, as professional videos and non-professional videos. The two groups were compared in terms of video characteristics, GQS, and modified DISCERN score. Moreover, to clarify the evolution of professional YouTube videos about POF, videos uploaded by professional sources were categorized into two different groups from the first 5 years and the last 5 years, and compared in terms of the aforementioned properties.

Statistical analysis

Statistical analysis was done with Statistical Package for the Social Sciences version 27 (SPSS IBM Corp., Armonk, NY, USA). The normality of variable distribution was determined with the Shapiro-Wilk test. Normally distributed continuous data were compared with the independent student's t test, and data without

normal distribution were compared with the Mann Whitney U test. Categorical variables were compared using the $\chi 2$ test. Data were analyzed at 95% confidence level and a p value less than 0.05 was accepted statistically significant.

RESULTS

According to the study design, 200 videos comprising 100 professional videos and 100 non-professional videos were included into the study. A total 12 videos with different languages other than English, 6 reposted videos, 4 silent videos, and 19 videos that included advertisements were excluded from the study.

The video characteristics including 'likes', 'dislikes', and 'comment' numbers were similar between the groups (p= 0.395, p= 0.291, and p= 0.286, respectively). The mean number of views was 2961 for professional videos and 2003 for non-professional videos (p= 0.006), and the mean duration of videos was 10 minutes for professional videos and 6 minutes for non-professional videos (p= 0.001). In addition, target audience of patients was significantly higher for non-professional videos (83.0% vs. 96.0%, p= 0.001) (Table 1).

When professional videos in the last 10 years were evaluated, 34 of them were uploaded between 2014-2018, and 66 were uploaded between 2019-2023. The number of 'dislikes', and 'comments' were not significantly different between the groups (p= 0.884 and p= 0.107), but the number of views and 'likes' were significantly higher in favor of professional videos between 2014-2018 (p= 0.033 vs. p= 0.037). Video duration was significantly shortened for videos between 2019-2023 (11 minutes and 8.5 minutes, p= 0.002). Patients as the target audience dominated videos prepared in the last 5 years (p= 0.001) (Table 2).

Table 1. Comparison of features of professional videos and non-professional videos

	Professional videos	Non-professional videos	*p* value
Number of videos	100	100	
Video parameters*			
Number of views	2961 (1196 - 4345)	2003 (659 - 3207)	**0.006**
Video length (min)	10 (5 - 14)	6 (2 - 10)	**0.001**
Likes	89 (42 - 139)	88 (58 - 129)	0.395
Dislikes	10 (4 - 15)	8 (3 - 14)	0.291
Comments	24 (11 - 36)	23 (9 - 32)	0.286
Target audience, n (%)			**0.001**
Doctors or health workers	17 (17.0%)	4 (4.0%)	
Patients	83 (83.0%)	96 (96.0%)	

*: median (interquartile range)

Table 2. Comparison of professional videos by years

	Professional videos (2014-2018)	Professional videos (2019-2023)	*p* value
Number of videos	34	66	
Video parameters*			
Number of views	3487 (2464 - 4548)	2276 (766 - 4177)	0.033
Video length (min)	11 (9 - 21)	8.5 (3 - 12)	0.002
Likes	105 (66 - 130)	79 (46 - 123)	0.037
Dislikes	9 (6 - 16)	10 (4 - 14)	0.884
Comments	29 (14 - 39)	22 (8 - 35)	0.107
Target audience, n (%)			
Doctors or health workers	10 (29.4%)	7 (10.6%)	0.001
Patients	24 (70.6%)	59 (89.4%)	

*: median (interquartile range)

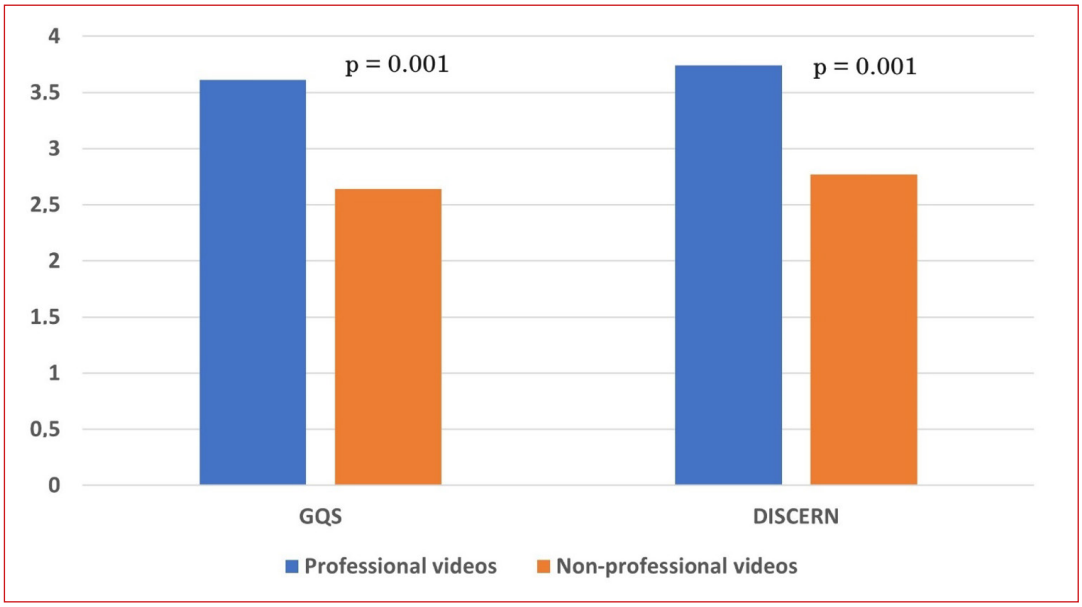

Figure 1. Comparison of DISCERN and GQS scores by category

GQS: Global quality score

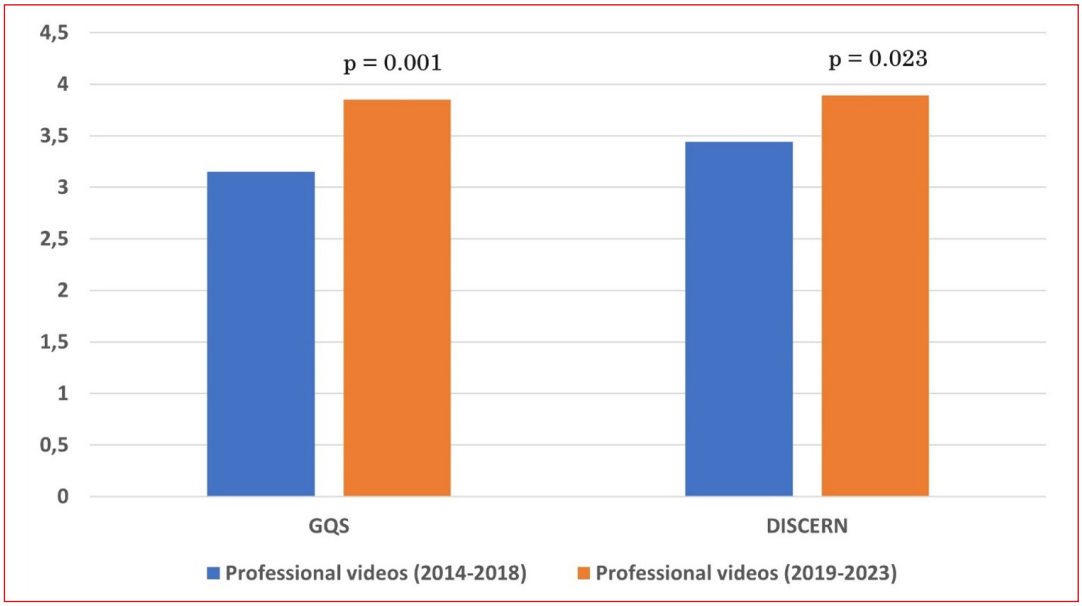

Figure 2. Comparison of DISCERN and GQS scores for professional videos by year

GQS: Global quality score

Comparison of GQS and modified DISCERN scores between professional and non-professional videos revealed that professional videos had significantly higher GQS and modified DISCERN score (p= 0.001 for each parameter) (Figure 1). Moreover, GQS and modified DISCERN scores of professional videos increased significantly in the last 5 years (p= 0.001 vs. p= 0.023) (Figure 2).

DISCUSSION

Internet-based sources have become an important tools for the public to get information about diseases. Previous reports about YouTube revealed that more than 90% of internet users watched videos that uploaded to YouTube (10). Despite high view rates for videos, quality and accuracy of YouTube videos is debatable. Because of these concerns, our study examined the features, adequacy and quality of YouTube videos about POF. Outcomes of the present study demonstrated that view number was significantly higher and video durations were significantly longer for professional videos. Also, according to GQS and modified DISCERN questionnaire, quality and reliability of videos were significantly better for professional videos. While the rate of professional videos being prepared for patients increased significantly in the last 5 years, the duration of the videos has significantly decreased and their quality has significantly increased.

To achieve objective analysis for video quality and reliability, GQS and modified DISCERN score were developed and externally

validated. Cakir and Caglar evaluated YouTube videos about pediatric urological disease with using the modified DISCERN questionnaire and GQS, and the authors found that YouTube videos about pediatric urological diseases had low quality. However, Cakir and Caglar also found that videos shared by professional sources had significantly better modified DISCERN score and GQS (11). Furthermore, when Aglamis et al. evaluated You tube videos on vulvodynia according to their origins, they showed that videos uploaded by professional sources ('universities/ professional organizations/nonprofit physicians/physicians') had higher modified DISCERN scores and GQSs. (12). In another research, Ferhatoglu and colleagues emphasized that professional YouTube videos about obesity surgery had significantly higher DISCERN score than non-professional YouTube videos about obesity surgery (13). Similarly, GQS was significantly higher for professional YouTube videos for orthodontic surgery in a study by Kılınc and Sayar (14). In accordance with the literature, our findings showed that professional YouTube videos about POF had significantly higher quality according to GQS and modified DISCERN scores. However, the aforementioned studies did not analyze the evolution of professional video quality over time. For the first time, the present study found that the quality of YouTube videos uploaded by professional sources significantly improved in the last 5 years.

Video duration and audience target may play roles in the number of views videos receive. Cetin and colleagues analyzed the features of YouTube videos about coronary artery bypass grafting, and did not find significant differences between professional and non-professional videos with regards to video duration. The authors stated that professional videos had higher view numbers (7). However, Andan and Aydin found that the quality of YouTube videos on ovarian cysts was generally considered to be of poor quality. They emphasized that poor quality videos were uploaded by non-physicians and attracted more attention than videos uploaded by doctors. (15). In another study, Ergul investigated the characteristics of YouTube Videos about surgical management of uterine leiomyomas. The author did not find significant differences between professional and non-professional videos in terms of video length and number of views (16). Results of the present study found that video length was significantly longer for professional videos, but duration of professional YouTube videos about POF significantly reduced in the last five years. Moreover, professional videos were more attractive for YouTube users according to view number.

The target audience for YouTube videos is critical for interaction rate. Baytaroglu and Sevgili analyzed YouTube videos about peripheral artery diseases, and did not find significant differences in term of target audience (17). Similarly, Yuksel and Cakmak showed similarity for target audience of YouTube videos about pregnancy and COVID-19 in their study (6). In contrast, our findings indicate that professional videos were prepared significantly more for doctors and healthcare professionals. However, in the last 5 years, the target audience for professional videos has changed significantly in favor of patients.

Although this is the first study investigating YouTube video quality about POF, the present study has some limitations. The study was performed only in English, as it is thought that analyzing multiple languages could be difficult. In addition, there may not be enough video to perform statistical analysis in less common languages. Moreover, English is the most frequently used language in YouTube and the scientific area. Also, this study encompassed a certain time period, but videos are continuously being uploaded to YouTube. Finally, analysis was based on searching for some keywords about POF, but people may use different terms when searching for YouTube videos about POF.

CONCLUSIONS

The findings of the present study showed that professional YouTube videos about POF had significantly higher quality and 'like' numbers, and the quality of professional YouTube videos about POF significantly increased in the last five years. The proportion of professional videos about POF being prepared for patients increased significantly in the last 5 years, but video length of professional videos significantly decreased.

Conflict of Interest
The authors declare no conflicts of interest.

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None

Human Ethics and Consent to Participate Declarations
Not applicable'

Availability of Data and Materials
All data analyzed during this study are included in this published article and its supplementary information file. The datasets analyzed during the current study are available from the corresponding author on reasonable request.

REFERENCES

1. Goswami D, Conway GS. Premature ovarian failure. Human reproduction update. 2005;11:391-410.
2. Haller-Kikkatalo K, Uibo R, Kurg A, Salumets A. The prevalence and phenotypic characteristics of spontaneous premature ovarian failure: a general population registry-based study. Human reproduction. 2015;30:1229-38.
3. Jankowska K. Premature ovarian failure. Menopause Review/Przegląd Menopauzalny. 2017;16:51-6.

4. Pohjanoksa-Mäntylä M, Bell JS, Helakorpi S, Närhi U, Pelkonen A, Airaksinen MS. Is the Internet replacing health professionals? A population survey on sources of medicines information among people with mental disorders. Social psychiatry and psychiatric epidemiology. 2011;46:373-9.
5. Freeman B, Chapman S. Is "YouTube" telling or selling you something? Tobacco content on the YouTube video-sharing website. Tobacco control. 2007;16:207-10
6. Yuksel B, Cakmak K. Healthcare information on YouTube: Pregnancy and COVID-19. Int J Gynaecol Obstet. 2020;150:189-193.
7. Cetin HK, Koramaz I, Zengin M, Demir T. The Evaluation of YouTube™ English Videos' Quality About Coronary Artery Bypass Grafting. Med Bull Sisli Etfal Hosp. 2023; 57: 130-135
8. Helming AG, Adler DS, Keltner C, Igelman AD, Woodworth GE. The content quality of youtube videos for professional medical education: a systematic review. Academic Medicine. 2021;96:1484-93.
9. Kumar VS, Subramani S, Veerapan S, Khan SA. Evaluation of online health information on clubfoot using the DISCERN tool. Journal of Pediatric Orthopaedics B. 2014;23:135-8.
10. Yoganarasimhan H. Impact of social network structure on content propagation: A study using YouTube data. Quantitative Marketing and Economics. 2012;10:111-50.
11. CAKİR H, Çağlar U. The Evaluation of YouTube Videos' Quality About Pediatric Urological Diseases. Acıbadem Üniversitesi Sağlık Bilimleri Dergisi. 2023;14:523-7.
12. Aglamis SO, Senel S, Koudonas A. Quality analysis of YouTube videos on vulvodynia. Sex Med. 2023;11(1):qfac013.
13. Ferhatoglu MF, Kartal A, Ekici U, Gurkan A. Evaluation of the reliability, utility, and quality of the information in sleeve gastrectomy videos shared on open access video sharing platform YouTube. Obesity surgery, 2019; 29, 1477-84.
14. Kılınç DD; Sayar G. Assessment of reliability of YouTube videos on orthodontics. Turkish journal of orthodontics, 2019, 32: 145-150.
15. Andan C, Aydin MF. Evaluation of the Reliability and Quality of YouTube Videos on Ovarian Cysts. Cureus. 2022;14(3):e22739.
16. Ergul A. Quality and Reliability of YouTube Videos on Surgical Treatment of Uterine Leiomyomas. Cureus. 2021;13:e20044.
17. Baytaroglu C, Sevgili E. Characteristics of YouTube videos about peripheral artery disease during COVID-19 pandemic. Cureus. 2021;13:7.

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ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

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Prediction of gestational diabetes mellitus risk in early pregnancy using antenatal screening biomarkers

Antenatal tarama biyobelirteçleri kullanılarak erken gebelikte gestasyonel diabetes mellitus riskinin tahmin edilmesi

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Yazarlar Gül Boran SARIOGLU ve Emre Erdem TAS bu çalışmaya eşit katkıda bulunmuştur ve eş yazarlardır.

ABSTRACT

Aim: In this study, we aimed to compare their success in predicting the risk of Gestational Diabetes Mellitus (GDM) using demographic (age, gravidity, parity), body mass index (BMI), first-trimester fasting blood glucose (FBG), thyroid-stimulating hormone (TSH), and antenatal screening biomarkers (dual and quadruple tests).

Materials and Methods: In this study, 800 pregnant women who underwent a one-step 75 g Oral Glucose Tolerance Test (OGTT) and antenatal screening tests at a tertiary hospital between January 2017 and June 2020 were retrospectively investigated. After patients were divided into two groups based on their GDM screening test results, the examined parameters were compared between the GDM-Positive and GDM-Negative groups. Once the parameters significantly associated with GDM were determined, their clinical utility in the early diagnosis of GDM was investigated.

Results: GDM was diagnosed in 159 (19.8%) of 800 patients. The GDM-Positive group had a higher age, gravidity, parity, BMI, and first-trimester serum FBG levels, as well as lower serum PAPP-A MoM levels than the GDM-Negative group (P <0.05). There were no significant differences between the groups based on serum TSH and f-βhCG, NT, AFP, uE3, ßhCG, and Inhibin-A MoM levels. Binary logistic regression analysis revealed that increased age (P=0.02, CI=1.007-1.096, OR=1.050), BMI (P<0.01, CI=1.452-3.213, OR=1.107), and first-trimester serum FBG levels were independently associated with GDM.

Conclusion: The use of first- and second-trimester antenatal screening tests for predicting GDM risk does not appear meaningful. Further studies are needed to determine the usability of these tests for early diagnosis of GDM in the Turkish population.

Keywords: Gestational diabetes mellitus, antenatal screening, risk assessment

ÖZ

Amaç: Bu çalışmada demografik veriler (yasş, gravida, parite), vücut kitle indeksi (VKİ), ilk-trimester açlık kan şekeri (AKŞ), tiroid uyarıcı hormon (TSH) ve antenatal tarama test biyobelirteçlerinin (ikili ve dörtlü tarama) Gestasyonel Diabetes Mellitus (GDM) riskini öngörmedeki başarılarını karşılaştırması amaçlanmıştır.

Gereç ve Yöntemler: Bu çalışmada Ocak 2017 – Haziran 2020 tarihleri arasında üçüncü basamak bir hastanede tek-basamak 75 gr Oral Glukoz Tolerans Testi (OGTT) ve antenatal tarama testleri yapılan 800 gebe retrospektif olarak incelendi. Olgular GDM tarama sonuçlarına göre iki gruba ayrıldıktan sonra GDM-Pozitif ve GDM-Negatif gruplar incelenen parametreler açısından karşılaştırıldı. GDM ile anlamlı derecede ilişkili parametreler belirlendikten sonra bunların GDM'nin erken tanısındaki klinik faydaları araştırıldı.

Bulgular: Sekiz yüz hastanın 159'una (% 19,8) GDM tanısı konuldu. GDM-Pozitif grup, GDM-Negatif gruba göre daha yüksek yaş, gravida, parite, VKİ ve ilk-trimester serum AKŞ düzeylerinin yanı sıra daha düşük serum PAPP-A MoM düzeylerine sahipti (P <0.05). Serum TSH ve f-βhCG, NT, AFP, uE3, ßhCG ve İnhibin-A MoM düzeyleri açısından gruplar arasında anlamlı fark yoktu. Lojistik regresyon analizinde, artan yaş (P=0.02, CI=1.007-1.096, OR=1.050), VKİ (P<0.01, CI=1.452-3.213, OR=1.107) ve ilk-trimester serum AKŞ düzeyleri GDM ile ilişkili bağımsız değişkenler olarak tespit edildi.

Sonuç: Birinci ve ikinci trimester antenatal tarama testlerinin GDM riskini öngörmede kullanılması anlamlı görünmemektedir. Bu testlerin Türk toplumunda GDM'nin erken tanısında kullanılabilirliğinin belirlenmesi için daha ileri çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Gestasyonel diabetes mellitus, antenatal tarama, risk değerlendirmesi

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INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as a glucose intolerance that first occurs or is diagnosed during pregnancy. GDM is a common complication of pregnancy associated with maternal and neonatal morbidities, including preeclampsia, polyhydramnios, fetal macrosomia, sudden infant death, and the risk of developing type 2 diabetes after pregnancy (1). The prevalence of GDM gradually increases with the average maternal age during pregnancy and rates of obesity (2).

GDM was diagnosed based on the results of a one-step 75 g OGTT or two-step 50 g screening and a 100 g OGTT performed at 24-28 weeks of gestation (3-5). Identification of pregnant women at a high risk of GDM in early pregnancy is important to facilitate preventive intervention, improve clinical outcomes, reduce maternal and fetal exposure to metabolic alterations, and improve antenatal care. Early diagnosis and treatment of GDM can significantly reduce maternal and fetal complications. The diagnosis of GDM after 24 weeks of gestation may lead to prolonged exposure to intrauterine hyperglycemia and macrosomia(6).

The first trimester dual screening test uses serum biochemical parameters such as free beta human chorionic gonadotropin (f-ßhCG), pregnancy-associated plasma protein-A (PAPP-A), and fetal nuchal translucency (NT). The second trimester quadruple screening test uses the serum biochemical parameters alpha fetoprotein (AFP), unconjugated estriol (uE3), ßhCG and Inhibin-A. These markers, which have been used to screen for genetic abnormalities in recent years, have also been reported to predict pregnancy complications such as preeclampsia, GDM, and intrauterine growth restriction (7-10).

In recent years, the number of studies on the diagnosis of GDM during early pregnancy has increased. Some studies have been published that explored the relationship between antenatal screening tests and GDM (11-14). However, there is still a lack of sufficient studies on this topic, and no definitive conclusions have been reached. This study aimed to investigate the relationship between GDM and the demographic, clinical, and dual or quadruple antenatal screening test characteristics of pregnant women.

MATERIAL AND METHODS

This retrospective cohort study was conducted at the Gynecology and Obstetrics Department of the Ankara Education and Research Hospital. This study was conducted in accordance with the principles outlined in the Declaration of Helsinki and approved by the Ethics Committee of the same institute (date: 27/08/2020, Approval no. -20 406). Written informed consent was obtained from all participants prior to their participation in the study.

This study investigated 1184 pregnant women who underwent a one-step 75-gr Oral Glucose Tolerance Test (OGTT) and antenatal screening tests (double and quadruple screening tests) at obstetric polyclinics between January 2017 and June 2020. Patient age, gravidity and parity, body mass index (BMI) (kg/m^2), smoking status, first-trimester serum fasting blood glucose (FBG) and thyroid-stimulating hormone (TSH) levels, double and quadruple antenatal screening test MoM values, and 75-gr OGTT levels were extracted from electronic medical reports. We also recorded whether the patients had an additional medical condition or had used assisted reproductive techniques.

Pregnant women with multiple pregnancies, pregnancies conceived using assisted reproductive techniques, pregestational diabetes or diabetes diagnosed in early pregnancy, any chronic disease, and smokers were excluded from the study. In the remaining cases, GDM was diagnosed according to the criteria of the International Association of Diabetes and Pregnancy Study Group (IADPSG) (at least one elevated value in a one-step 75-g OGTT performed between 24- and 28-weeks' gestation)(4).

After the patients were divided into positive and negative GDM screening test groups, the groups (GDM-Positive vs. GDM-Negative) were compared in terms of the examined parameters. Once the parameters significantly associated with GDM were determined, their clinical utility in the early diagnosis of GDM was investigated.

Statistical Analysis

Data are expressed as mean ± standard deviation. The groups (GDM-Positive and GDM-Negative) were compared using independent-sample t-tests. Variables with $p<0.05$ were included in the binary logistic regression analysis, and the influence of each factor on the early diagnosis of GDM was evaluated. Statistical analyses were performed using the Statistical Package for the Social Sciences for Windows, version 21.0 (IBM, SPSS Corp.; Armonk, NY, USA). Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Statistical significance was set at $p < 0.05$.

RESULTS

Of the 1186 patients, 386 (32.5%) were excluded from the study due to chronic comorbidities, multiple pregnancies, missing data, or smoking. Of the remaining 800 patients, 159 (19.8%) were diagnosed with GDM. A flow diagram of the participants recruited for the study is presented in Figure 1.

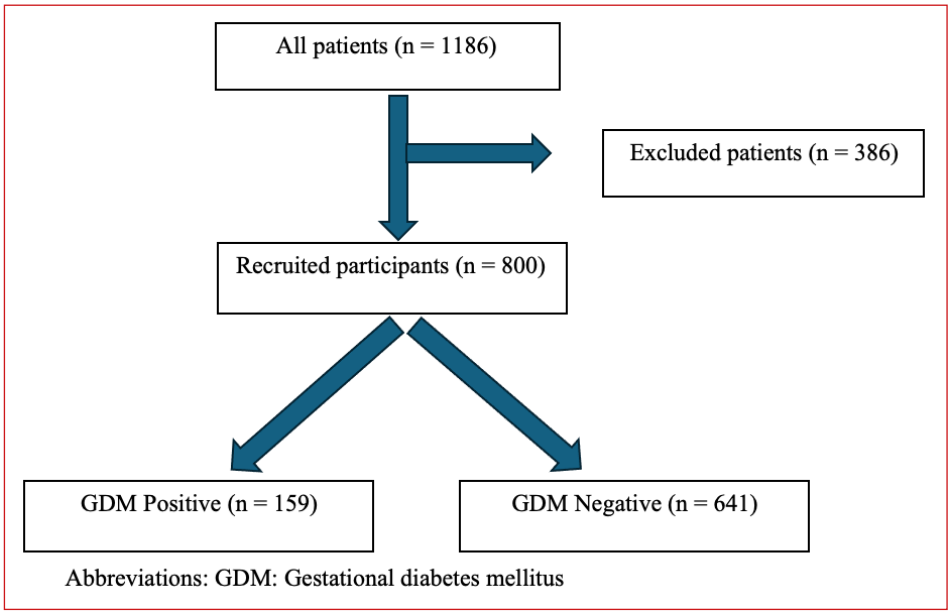

Figure 1. Flow diagram of the study recruitment process.

Table 1. The demographic and clinical characteristics of all patients and GDM-Positive and GDM-Negative groups

Characteristics, mean ± SD	All cases (n = 800)	GDM-Positive (n = 159)	GDM-Negative (n = 641)	P Value
Age (years)	27.0 ± 5.5	28.7 ± 5.4	26.6 ± 5.4	<0.01
Gravidity	2.4 ± 1.2	2.6 ±1.2	2.3 ±1.1	0.01
Parity	1.1 ± 0.9	1.3 ± 0.9	1.0 ± 0.9	<0.01
BMI (kg/m²)	25.2 ± 6.2	27.3 ± 4.8	24.7 ± 4.3	<0.01
First-trimester FBG (mg/dl)	87.3 ± 11.5	90.4 ± 3.1	85.9 ± 10.9	<0.01
TSH (mU/ml)	1.8 ± 2.0	1.8 ± 1.6	1.8 ± 2.1	0.78
PAPP-A MoM	1.1 ± 0.6	1.0 ± 0.6	1.1 ± 0.5	<0.01
f-βhCG MoM	1.1 ± 0.5	1.0 ± 0.6	1.1 ± 0.5	0.34
NT MoM	0.7 ± 0.2	0.7 ± 0.2	0.7 ± 0.2	0.75
AFP MoM	1.1 ± 0.4	1.1 ± 0.4	1.1 ± 0.4	0.29
uE3 MoM	1.1 ±0.1	1.1 ±0.3	1.1 ±0.3	0.59
ßhCG MoM	1.0 ± 0.6	1.0 ± 0.6	1.0 ± 0.5	0.64
Inhibin-A MoM	1.1 ± 0.5	1.0 ± 0.4	1.1 ± 0.5	0.14

AFP: Alpha Feto Protein, BMI: Body mass index, FBG: Fasting blood glucose, f-ßhCG: Free Beta Human Chorionic Gonadotropin, GDM: Gestational Diabetes Mellitus, MoM: Multiples of Median, NT: Nuchal Translucency, TSH: Thyroid Stimulating Hormone, PAPP-A: Pregnancy Associated Plasma Protein-A, uE3: Unconjugated Estriol, ßhCG: Beta Human Chorionic Gonadotropin.

The demographic and clinical characteristics of all patients and groups (GDM-Positive and GDM-Negative) included in this study are presented in Table 1. When the groups were compared, age, gravidity, parity, BMI, and first-trimester serum FBG levels were significantly higher, whereas serum PAPP-A MoM levels were significantly lower in the GDM-Positive group than in the GDM-Negative group (P <0.05) (Table 1). There were no significant differences between the groups based on serum TSH and f-βhCG, NT, AFP, uE3, ßhCG, and Inhibin-A MoM levels (Table 1).

Binary logistic regression analysis revealed that among the variables that differed significantly between the GDM-Positive

Table 2. Binary logistic regression analysis of risk factors associated with GDM-positive group

	P value	95% CI	RR
Age (years)	**0.02**	1.007 – 1.096	1.050
Gravidity	0.55	0.669 – 1.239	-
Parity	0.40	0.794 – 1.769	-
First-trimester FBG (mg/dl) **BMI (kg/m²)**	**<0.01** **<0.01**	1.060 – 1.157 1.452 – 3.213	1.042 1.107
PAPP-A MoM	0.68	0.660 – 1.313	

BMI: Body mass index; FBG: Fasting blood glucose; GDM, gestational diabetes mellitus; MoM, multiples of median; PAPP-A, pregnancy-associated plasma protein-A.

and GDM-Negative groups, increased age, first trimester serum FBG levels, and BMI were independently associated with GDM (Table 2).

DISCUSSION

The incidence of GDM varies according to the population and diagnostic criteria. Studies using the traditional Carpenter and Coustan criteria have shown a prevalence of between 2% and 38% in different populations (15). However, the global prevalence of GDM is estimated to be approximately 17% according to the IADPSG (16). In a recent review of the results of studies conducted in different regions to determine the prevalence of GDM in Turkey, the prevalence of GDM was found to be 20% when the IADPSG criteria were used (17). In this study, the prevalence of GDM was 19.8%, which is close to the general average in Turkey.

Increased maternal age is also a risk factor for GDM. The First and Second Trimester Evaluation of Risk trial showed a continuous positive association between advancing maternal age and the risk of adverse pregnancy outcomes, including GDM (18). In a review and systematic meta-analysis of over 120 million participants, Li et al. showed that GDM risk exhibited a linear relationship with maternal age (19). Similarly, in the present study the mean of maternal age significantly higher in GDM-Positive group than in the GDM-Negative group (28.7 years vs 27.0 years, p<0.01). Additionally, our study revealed that increased maternal age was an independent risk factor for GDM (P=0.02, CI=1.007-1.096, OR=1.050).

Our research demonstrated that gravidity and parity were significantly higher in the GDM-Positive group than in the GDM-Negative group (P <0.05). However, high gravidity or high parity alone did not serve as independent risk factors for GDM, as their respective P-values were 0.55 and 0.40. We posit that this finding is related to increasing age and BMI in the GDM-Positive group. Our study aligns with the findings of Boyko et al. and Al-Rowaily et al., who showed that, although GDM was more prevalent in parous women, the significant difference disappeared when the groups were equalized with respect to age and BMI (20, 21).

Several research efforts in the United States and other countries have shown an increased likelihood of developing GDM in overweight or obese women compared with those who are lean or of normal weight (3-5, 17, 22). In a recent meta-analysis, Chu et al. estimated that the risk of GDM is approximately two, four, and eight times higher among overweight, obese, and severely obese women, respectively, than among normal-weight pregnant women (22). Similarly, Karacam et al. reported in their meta-analysis that being overweight was a risk factor for GDM development in the Turkish population(17). In the present study, the mean BMI was significantly higher in GDM-Positive group than in GDM-Negative group (27.1 years vs 24.7 years, P<0.01), and increased BMI was an independent risk factor for GDM (P<0.01, CI=1.452-3.213, OR=1.107).

GDM and thyroid dysfunction are two of the most common endocrine disorders that occur during pregnancy. Some previous reports showed a higher prevalence of thyroid dysfunction among women with GDM than among controls, whereas other studies did not find any association (23). In the present study, we did not identify any significant differences in serum TSH values between the GDM Positive and-negative groups (p>0.05). On the other hand, in a retrospective study of more than 40.000 pregnant women,

Tong et al. showed a positive linear relationship between first-trimester FBG levels and GDM (24). Similarly, in the present study, the mean first-trimester FBG levels were significantly higher in the GDM Positive group than in the GDM Negative group (90.4 mg/dl vs 85.9 mg/dl, p<0.01). Additionally, our study revealed that the first-trimester FBG level was an independent risk factor for GDM (p<0.01, CI=1.060-1.157, OR=1.042).

In recent years, the usefulness of antenatal screening tests used in the first and second trimesters for fetal aneuploidy in the early diagnosis of GDM has been investigated and exciting results have been obtained. However, there are also inconsistencies in the results of these studies. For example, in two different studies examining the association of dual screening parameters with GDM, Borna et al. found a significant association only between low PAPP-A levels and GDM, while Genc et al. found a significant association only between low f-ßhCG and GDM (11, 12). To the best of our knowledge, no study has reported a significant association between NT and GDM. In this study, serum PAPP-A levels were significantly lower in the GDM Positive group than in the GDM Negative group (P <0.05). Our results were consistent with those reported by Borno et al (11). However, we did not identify low serum PAPP-A level as an independent risk factor for GDM (P=0.68). On the other hand, there are inconsistencies in the few studies that have evaluated the association between quadruplet screening test parameters and GDM. In a previous study, Yue et al. reported that increased serum hCG levels were associated with GDM; however, Snyder et al. reported that increased serum uE3 and inhibin-A levels were related with GDM (13, 14). In contrast to those studies, we did not demonstrate significant differences between the GDM Positive and GDM Negative groups based on serum AFP, uE3, ßhCG, and inhibin-A levels (P>0.05).

In conclusion, this study showed that advanced maternal age, increased BMI, and high first-trimester FBG levels are independent risk factors for GDM. However, unlike previous studies, we did not observe a significant relationship between antenatal screening tests and GDM. Further studies are needed to determine the usability of these tests for early diagnosis of GDM in the Turkish population.

Author Contributions

EET and GBS contributed to study conception and design. Data collection, analysis, interpretation, and drafting of the manuscript were performed by EET and GBS.

Conflict of Interest

The authors declare no conflict of interest.

REFERENCES

1. Sweeting A, Wong J, Murphy HR, Ross GP. A Clinical Update on Gestational Diabetes Mellitus. Endocr Rev. 2022;43(5):763-93.
2. Zehravi M, Maqbool M, Ara I. Correlation between obesity, gestational diabetes mellitus, and pregnancy outcomes: an overview. Int J Adolesc Med Health. 2021;33(6):339-45.
3. Diagnostic criteria and classification of hyperglycaemia first detected in pregnancy: a World Health Organization Guideline. Diabetes Res Clin Pract. 2014;103(3):341-63.
4. Metzger BE, Gabbe SG, Persson B, Buchanan TA, Catalano PA, Damm P, et al. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. Diabetes Care. 2010;33(3):676-82.
5. ACOG Practice Bulletin No. 190: Gestational Diabetes Mellitus. Obstet Gynecol. 2018;131(2):e49-e64.
6. Bartha JL, Martinez-Del-Fresno P, Comino-Delgado R. Early diagnosis of gestational diabetes mellitus and prevention of diabetes-related complications. Eur J Obstet Gynecol Reprod Biol. 2003;109(1):41-4.
7. Caliskan R, Atis A, Aydin Y, Acar D, Kiyak H, Topbas F. PAPP-A concentrations change in patients with gestational diabetes. J Obstet Gynaecol. 2020;40(2):190-4.
8. Yanachkova V, Staynova R, Stankova T, Kamenov Z. Placental Growth Factor and Pregnancy-Associated Plasma Protein-A as Potential Early Predictors of Gestational Diabetes Mellitus. Medicina (Kaunas). 2023;59(2).
9. Huang J, Chu X, Chen Y. Correlation and diagnostic value of maternal serum alpha-fetoprotein level, predelivery age and body mass with gestational diabetes mellitus. Gynecol Endocrinol. 2021;37(1):83-7.
10. Quintanilla Rodriguez BS, Mahdy H. Gestational Diabetes. StatPearls. Treasure Island (FL): StatPearls Publishing Copyright © 2024, StatPearls Publishing LLC.; 2024.
11. Borna S, Ashrafzadeh M, Ghaemi M, Eshraghi N, Hivechi N, Hantoushzadeh S. Correlation between PAPP-A serum levels in the first trimester of pregnancy with the occurrence of gestational diabetes, a multicenter cohort study. BMC Pregnancy Childbirth. 2023;23(1):847.
12. Genc S, Ozer H, Emeklioglu CN, Cingillioglu B, Sahin O, Akturk E, et al. Relationship between extreme values of first trimester maternal pregnancy associated plasma Protein-A, free-β-human chorionic gonadotropin, nuchal translucency and adverse pregnancy outcomes. Taiwan J Obstet Gynecol. 2022;61(3):433-40.
13. Yue CY, Zhang CY, Ying CM. Serum markers in quadruple screening associated with adverse pregnancy outcomes: A case-control study in China. Clin Chim Acta. 2020;511:278-81.
14. Snyder BM, Baer RJ, Oltman SP, Robinson JG, Breheny PJ, Saftlas AF, et al. Early pregnancy prediction of gestational diabetes mellitus risk using prenatal screening biomarkers in nulliparous women. Diabetes Res Clin Pract. 2020;163:108139.
15. Bilous RW, Jacklin PB, Maresh MJ, Sacks DA. Resolving the Gestational Diabetes Diagnosis Conundrum: The Need for a Randomized Controlled Trial of Treatment. Diabetes Care. 2021;44(4):858-64.
16. Guariguata L, Linnenkamp U, Beagley J, Whiting DR, Cho NH. Global estimates of the prevalence of hyperglycaemia in pregnancy. Diabetes Res Clin Pract. 2014;103(2):176-85.
17. Karaçam Z, Çelİk D. The prevalence and risk factors of gestational diabetes mellitus in Turkey: a systematic review and meta-analysis. J Matern Fetal Neonatal Med. 2021;34(8):1331-41.
18. Cleary-Goldman J, Malone FD, Vidaver J, Ball RH, Nyberg DA, Comstock CH, et al. Impact of maternal age on obstetric outcome. Obstet Gynecol. 2005;105(5 Pt 1):983-90.
19. Li Y, Ren X, He L, Li J, Zhang S, Chen W. Maternal age and the risk of gestational diabetes mellitus: A systematic review and meta-analysis of over 120 million participants. Diabetes Res Clin Pract. 2020;162:108044.

20. Boyko EJ, Alderman BW, Keane EM, Baron AE. Effects of childbearing on glucose tolerance and NIDDM prevalence. Diabetes Care. 1990;13(8):848-54.

21. Al-Rowaily MA, Abolfotouh MA. Predictors of gestational diabetes mellitus in a high-parity community in Saudi Arabia. East Mediterr Health J. 2010;16(6):636-41.

22. Chu SY, Callaghan WM, Kim SY, Schmid CH, Lau J, England LJ, et al. Maternal obesity and risk of gestational diabetes mellitus. Diabetes Care. 2007;30(8):2070-6.

23. Pinto S, Croce L, Carlier L, Cosson E, Rotondi M. Thyroid dysfunction during gestation and gestational diabetes mellitus: a complex relationship. J Endocrinol Invest. 2023;46(9):1737-59.

24. Tong JN, Wu LL, Chen YX, Guan XN, Tian FY, Zhang HF, et al. Fasting plasma glucose in the first trimester is related to gestational diabetes mellitus and adverse pregnancy outcomes. Endocrine. 2022;75(1):70-81.