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Editorial / Editörden

Çok Değerli Okuyucularımız,

Türk Kadın Sağlığı ve Neonatoloji Dergisi (Turkish Journal of Women's Health and Neonatology) 2024 yılı ikinci sayısıyla huzurlarınızdayız. Bu sayımızda üç özgün araştırma, iki olgu sunumunu zevkle okuyacağınızı ümit ediyoruz.

Kan nakli, doku nakline eşdeğer, birçok riski taşıyan hayat kurtarıcı bir tedavi yöntemidir. Yoğun çalışmalara rağmen kan ve kan bileşenlerinin yerini alabilecek yapay maddelerin şimdilik üretilememesi nedeniyle kan ve kan bileşenlerinin kullanımı kaçınılmazdır. Bir çalışmada bir merkezde yapılan kan transfüzyonu sayısı, kan ürünü sayısı, yatan ve ayaktan hasta sayısındaki değişim retrospektif olarak analiz edilmiştir.

Bir başka çalışmada borderline over tümörüne sahip hastalarda fertilite koruyucu ve/veya radikal cerrahilerin sonuçları, fertilite koruyucu cerrahinin fertilite üzerine etkisi ve postoperatif nüks oranları değerlendirilmiştir.

Bir sonraki sayımızda yeni ve ilginç makalelerle buluşmak üzere…

Saygılarımla,
Prof. Dr. Yaprak Üstün
Baş Editör

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Original Article

Evaluation of the Use of Blood and Blood Components of Etlik Zübeyde Hanım Gynecology and Obstetrics Clinics Training and Research Hospital Between 2021 and 2023

Etlik Zübeyde Hanım Kadın Hastalıkları ve Doğum Eğitim Araştırma Hastanesi'nde Kan ve Kan Bileşenlerinin 2021-2023 Yılları Arasında Kullanımlarının Kliniklere Göre Değerlendirilmesi

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Abstract

Objective: The aim of this study is to determine the distribution of blood components by hospitals, to obtain information on hospital preferences for blood products, to determine the quantities of blood products requested and used, and to examine rates of noncompliance with blood product requirements.

Material and Method: This is a single-centre retrospective study conducted between January 2021 and December 2023. In this study, we retrospectively analysed the changes in the number of blood transfusions, blood products, inpatients and outpatients.

Results: In our study, a total of 8702 units of blood products including 5705 units of erythrocyte suspension (65.63%), 2750 units of fresh frozen plasma (31.63%), 183 units of pooled platelets (2.10%), 54 cryoprecipitate (0.62%) were used in Etlik Zübeyde Hanım Gynaecology and Obstetrics Training and Research Hospital in the last 3 years.

Conclusion: Erythrocyte suspension was the most commonly used blood product in the last 3 years. The least used blood product was cryoprecipitate. Due to supply options and transfusion combinations, blood transfusion should be individualised considering the cost-benefit ratio. Case-by-case assessment of blood transfusion rates would be useful to achieve a significant reduction in blood transfusion collection and especially disposal rates.

Keywords: blood products; blood transfusion; COVID-19; obstetrics; gynecology; oncology

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Öz

Amaç: Bu çalışmanın amacı kan bileşenlerinin hastanelere göre dağılımını belirlemek, hastanelerin kan ürünleri tercihleri hakkında bilgi edinmek, talep edilen ve kullanılan kan ürünleri miktarlarını belirlemek ve kan ürünü taleplerine uyumsuzluk oranlarını incelemektir.

Gereç ve Yöntem: Bu çalışma Ocak 2021 ile Aralık 2023 tarihleri arasında yapılmış tek merkezli retrospektif bir çalışmadır. Bu çalışmada kan transfüzyonu sayısı, kan ürünü sayısı, yatan ve ayaktan hasta sayısındaki değişimi retrospektif olarak analiz ettik.

Bulgular: Çalışmamızda 5705 ünite eritrosit süspansiyonu (%65,63), 2750 ünite taze donmuş plazma (%31,63), 183 ünite havuzlanmış trombosit (%2,10), 54 adet kriyopresipitat (%0,62) olmak üzere toplam 8702 ünite kan ürünü Etlik Zübeyde Hanım Kadın Hastalıkları ve Doğum Eğitim ve Araştırma Hastanesi'nde son 3 yılda kullanılmıştır.

Sonuç: Son 3 yıl içerisinde en çok kullanılan kan ürünü Eritrosit Süspansiyonudur. En az kullanılan kan ürünü ise kriyopresipitattır. Tedarik seçenekleri ve transfüzyon kombinasyonları nedeniyle kan transfüzyonu, maliyet-fayda oranı dikkate alınarak bireyselleştirilmelidir. Kan transfüzyonu oranlarının vaka bazında değerlendirilmesi, kan transfüzyonu toplama ve özellikle imha oranlarında önemli bir azalma sağlamak için faydalı olacaktır.

Anahtar Kelimeler: kan ürünleri; kan transfüzyonu; COVID-19; kadın doğum; jinekoloji; onkoloji

1. Introduction

Blood transfusion is a life-saving treatment that is equivalent to a tissue transplant and carries many risks. Despite intensive studies, the use of blood and blood components is unavoidable, as artificial substances that can replace blood and its components cannot be produced for the time being (1). The most important point in the clinical use of blood is that blood transfusions should be administered in the minimum amount to meet the needs with correctly selected blood components for appropriate indications. The aim is to help patients who need blood components with the least possible harm (2). A common goal of hospitals around the world is to make better use of available blood resources by maximizing the number of patients that can be cared for and reducing blood waste. Managing blood is difficult because blood products are perishable, supply is stochastic and demand is highly uncertain. In addition, red blood cells are categorized into different groups and must be compatible with patients. Due to the difficulties in procuring blood products, their optimal use and their high risks, they are only recommended if the expected benefits for the patient outweighs the possible risks. This is because unsafe and unnecessary transfusions expose patients to serious adverse transfusion reactions and infection risks (3). In addition, access to blood products for patients who really need them is limited. Since alternative products that can replace these products have not yet been developed worldwide, it is important to use blood and blood products rationally and minimize waste. The World Health Organization (WHO) has stated that hospitals and transfusion centers are among the main contributors to healthcare waste (4). Studies show that waste can be caused by donor selection, blood collection, blood product manufacturing, transportation and transfer process, storage of blood products in inappropriate conditions, excessive reserve of blood products, expiry date of products, quality control results and seropositivity, lack of training and wrong indications (5,6). Keeping the cost of blood products under control is one of the most important issues facing healthcare professionals. The main goal is to optimize the use of blood products and keep costs under control. Studies show that the waste of blood products can be significantly reduced if the guidelines for the use of blood products are followed. The provision of safe and sufficient blood should be an integral part of every country's national health policy. The WHO recommends that all activities related to the collection, testing, storage, processing and distribution of blood should be coordinated at the national level through integrated blood supply networks. In 2018, 73% of countries reporting to the WHO had a national blood policy, and most of them were developed countries (3). On March 20, 2019, the "Technical Assistance Project for the Development of a Blood Transfusion Management System in Turkey" funded by the European Union and the Republic of Turkey was launched in Turkey with the Ministry of Health as the beneficiary organization. The main objective is to reduce waste and control costs by making arrangements to ensure that blood collected from a limited number of donors is used for patients who need it most.

The aim of this study was to determine the distribution of blood components by hospital, to obtain information on hospital preferences for blood products, to determine the quantity of blood products requested and used, and to investigate the rate of incompatibilities in hospital requests for blood products.

2. Materials and Methods

This study was a retrospective chart review of patients treated with blood and blood products between 01.01.2021 and 01.01.2024 at Etlik Zübeyde Hanım Gynecology and Obstetrics Training and Research Hospital, a reference hospital. The change in the use of blood products by the patients registered in the hospital information system, i.e. erythrocyte suspension (ES), platelet suspension, fresh frozen plasma (FFP), cryoprecipitate and whole blood, was evaluated retrospectively by year and unit without differentiating by age, sex, nationality, diagnosis, internal medicine-surgery clinic, intensive care unit. The study protocol was approved by the Ethics Committee for Non-Interventional Studies of Etlik Zuebeyde Hanım Research and Training Hospital (Decision No:4/9 24.04.2024). All participants signed written and verbal informed consent and the principles of the Declaration of Helsinki were adhered to.

The study included female patients over 18 years of age who were treated and followed up in our hospital and in whom blood and blood products were used. Exclusion criteria were patients who refused treatment, patients who did not agree to participate in the study, male patients and patients under 18 years of age. The International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) codes of hospitalized patients were also retrieved from the hospital database.

Statistical analysis

SPSS 20 (IBM Corp. published 2011. IBM SPSS Statistics for Windows, version 20.0, Armonk, NY: IBM Corp.) was used to analyze the data. The data were analyzed using visual (histograms, probability plots) and analytical methods (Kolmogorov–Smirnov/ Shapiro–Wilk tests) to determine their normal distribution. A p-value < 0.05 was considered an indication of statistical significance.

3. Results

In our study, a total of 8702 units of blood products including 5705 units of erythrocyte suspension (65.63%), 2750 units of fresh frozen plasma (31.63%), 183 units of pooled platelets

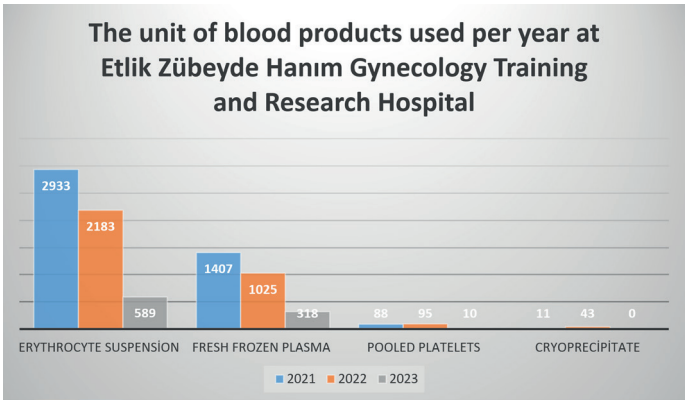

Figure 1. The unit of blood products used per year at Etlik Zübeyde Hanım Gynecology Training and Research Hospital shows

(2.10%) and 54 units of cryoprecipitate (0.62%) were used in Etlik Zübeyde Hanım Gynecology Training and Research Hospital during the last 3 years (Figure 1). Erythrocyte suspension was the most commonly used blood product each year. Cryoprecipitate was the least used blood product per year. In 2021, a total of 4439 units of blood products were used, including 2933 units of erythrocyte suspension (66.07%), 1407 units of fresh frozen plasma (31.69%), 88 units of pooled platelets (1.98%) and 11 units of cryoprecipitate (0.24%). In 2022, a total of 3336 units of blood products were used, including 2183 units of red blood cell suspension (65.43%), 1025 units of fresh frozen plasma (30.72%), 85 units of pooled platelets (2.54%) and 43 units of cryoprecipitate (1.28%). In 2023, a total of 917 units of blood products were used, including 589 units of red blood cell suspension (64.23%), 318 units of fresh frozen plasma (34.67%) and 10 units of pooled platelets (1.09%). No cryoprecipitate was used in 2023.

In 2021, most blood products were used in the fields of obstetrics, gynecology and puerperium. The most commonly used blood product was erythrocyte suspension and the least used product was cryospecipitate. In 2022, the services that used the most blood products were gynecology, gynecology service and high risk pregnancies service. In 2023, the services that used the most blood products were gynecology, obstetrics and gynecologic oncology. The most commonly used blood product was erythrocyte suspension and the least used product was platelets (Table 1).

In the first year (2021), 22 adverse reactions were reported in 1487 patients (4428 units of blood products) who received a transfusion of blood products. The reaction rate was reported as 1.41%. In 2022, an adverse reaction was reported in 21 out of

Table 1. The number of crossmatches and the number of transfusions by hospital service per year

	2021		2022		2023	
Hospital Services	Cross-match	Transfusion	Cross-Match	Transfusion	Cross-match	Transfusion
Infertility	181	144	134	94	27	16
High-Risk Pregnancy Service	108	77	83	71	0	0
Perinatology Intensive Care	34	28	31	29	0	0
Chemotherapy (Gynecologic Oncology)	314	254	5	4	0	0
Gynecology	692	534	515	433	260	213
Outpatient 18 (Gynecologic Oncology)	172	132	3	3	3	3
Gynecologic Oncology	684	537	234	211	118	84
Early Pregnancy 3A Service	188	156	98	94	20	18
Maternity Service	378	309	430	420	151	118
High-Risk Pregnant Woman Maternity Service	59	17	314	267	19	14
Emergency	0	0	3	3	0	0
Postpartum Service	871	706	556	554	109	79
Total	3681	2933	2632	2183	761	589

Table 2. Blood products used in 2021, 2022 and 2023 and the number of patients who developed side effects related to these products and the reactions observed

	Years		
Number of Patients	2021	2022	2023
Total Erythrocyte suspension (n)	2933	2183	589
Febrile non -hemolytic reaction (n)	1	1	1
Mild allergic reaction (n)	3	2	-
Hypotensive transfusion reaction (n)	2	1	2
Total Platelet suspension (n)	88	95	10
Febrile non -hemolytic reaction (n)	-	-	-
Mild allergic reaction (n)	-	1	-
Hypotensive transfusion reaction (n)	-	-	-
Total Fresh frozen plasma (n)	1407	1025	318
Febrile non -hemolytic reaction (n)	2	-	-
Mild allergic reaction (n)	14	16	5
Hypotensive transfusion reaction (n)	-	-	-

957 patients (3303 blood products) who received a transfusion of blood products. The adverse reaction rate was determined to be 2.19%. In 2023, 8 adverse reactions were reported in 285 patients (917 blood products) who received blood product transfusions. The reaction rate was 2.80% (Table 2).

4. Discussion

The need for blood and blood products is increasing day by day. Despite all the studies, no artificial product has yet been found that can replace blood, so its use remains unavoidable. Blood transfusions are equivalent to tissue transplants or even organ

transplants and represent a risky and life-saving treatment method (7). Against this background, we wanted to determine in our study where and how much blood and blood products have been used in our hospital in the past 3 years. In 2021, with the outbreak of the COVID-19 pandemic in the province where our hospital is located and in other major provinces, the Ministry of Health of the Republic of Turkey developed a Clean Hospitals Strategy. As part of this strategy, hospitals were divided into two groups: Hospitals where COVID-19 cases were treated (1- Pandemic Hospitals) and hospitals where COVID-19 cases were referred to the hospitals in the first group (2- Clean Hospitals). With this distinction, sensitive patients such as oncology patients and pregnant women whose treatment could not be postponed were mainly treated in clean hospitals. Although such a dual care strategy seems reasonable, the current study cannot provide comparative analytical data to evaluate the effectiveness of this strategy. However, it shows how the frequency of blood product use in our hospital has changed over this period according to changing needs. On the other hand, a change in our patient population was observed in 2023 due to a change in hospital staff and a change in the building where the service is provided. In this case, our results were affected. However, the most commonly used product in all 3 years is the erythrocyte suspension, which is consistent with the literature.

When we look at the literature, the results of the studies are the results of general hospitals rather than specialty hospitals. In the study conducted by Küçüktaş et al. on the evaluation of the use of blood and blood components by the hospital at Düzce College Health Application and Research Center, in 7341 units of blood product transfusions, the transfusion rate of erythrocyte suspensions was 59% and the transfusion rate of fresh frozen plasma was 22%. They found that 18% of platelet suspensions, 0.05% of cryoprecipitate transfusions and 0.05% of whole blood transfusions were performed. the study used 4327 units of ES, 1587 units of FFP, 1344 units of platelet suspension, 42 units of cryoprecipitate and 41 units of whole blood (8).

In an original retrospective study conducted by Yüksel et al. 2019 in an emergency department with 227 patients, it was found that the most commonly transfused blood product was ES, both in the literature and in their own study: “In our study, ES was the most commonly transfused, as in the literature.” (9). In their retrospective study conducted by Doğan et al. in the emergency department, they found that ES was widely used, which is consistent with the literature: “We found that 84.8% of 469 blood and blood products were erythrocyte suspensions, which is consistent with the literature” (10). Circular No. B100THG100004/5190 on the use of whole blood, published by the Directorate General of Treatment Services of the Ministry of Health in 2006 and updated in 2016, states that whole blood is accepted worldwide as a raw material and is used in transfusion medicine only for certain indications and that the Ministry has set a target to increase the use of whole blood to 5%. It has been stated that this percentage can be reduced to approximately (11).

The most important supplier of blood products in our country is the Turkish Red Crescent. The Turkish Red Crescent covers 90% of the blood product needs of all hospitals. On the other hand, each hospital can carry out platelet apheresis procedures within its capacity. According to the Turkish Red Crescent, 2 million 809 thousand 237 units of blood were donated in 2019. In 2020, it was 2 million 370 thousand 912 donations (12). The Red Crescent donation rate fell by 15.6% nationwide between 2019 and 2020. In the first 3 months of the pandemic (April-July 2020), a decrease in donations of up to 22 was reported Al-Riyami et al. (13). In a multicenter study conducted by, it was reported that 75% of participating centers experienced a decline in blood donation rates (14). Similarly, a study conducted in China found that blood donor rates dropped by 67 with the outbreak of the epidemic. A report from Colombia also reported a drop in blood donations of up to 65% (15). A report from Italy noted a 32% drop in blood donations, although there was no shortage of blood products in all departments except infectious disease and intensive care units. The decline in blood donations at national level was lower in our country than in many other countries. This could be due to the fact that blood donations are mainly collected by state blood banks under the control of the Turkish Red Crescent. The Turkish Red Crescent, like other organizations, actively promotes blood donation through social media, television and posters (13-17).

Another reason is that 60% of blood donations in our country come from family members. In our study, it was found that no whole blood suspension was used in our hospital in the last 3 years. It turned out that 0.05%, which is less than the 5% targeted in the Ministry of Health circular, was used. In the study we conducted, the most commonly used blood product in the 3 years in question was therefore an erythrocyte suspension, which is consistent with the literature.

With the emergence of the COVID-19 pandemic, the government of our country imposed school closures, the switch to hybrid learning in schools and weekend curfews from April 2020. The bans were in force until July 1, 2021. During the pandemic, outpatient and inpatient admissions fell by 34.3% and 39.8% respectively compared to the pre-pandemic period. The rate of ES transfusions throughout the hospital fell significantly during

the pandemic. The use of the operating theater in this hospital also fell by 21.3 during the pandemic compared to the pre-pandemic period. The decline in operating room activity in this hospital is in line with that of Delabranche et al. However, it is not as severe as reported in their study (18). They reported that during this period, the number of inpatient procedures decreased by 62, the number of surgical procedures decreased by 57, and outpatient surgery was rarely performed. Similarly, the number of elective surgeries in the United States has decreased by 91% during the COVID-19 pandemic (19). Some other studies at a single center reported the postponement of most or all elective surgeries; this is consistent with several guidelines recommending the postponement of elective surgeries (20-23). In this hospital, there was not such a dramatic decline. This is primarily due to the additional diagnostic and treatment needs of pregnant patients referred from pandemic hospitals.

As this study is a retrospective study, prospective and more comprehensive studies are needed to substantiate the results obtained. The most important strength of our study is that, as a maternity hospital, we analyzed our clinical data to include the period of the pandemic. The most important limitation is that we did not have access to patient demographic data. Due to supply difficulties and transfusion complications, blood transfusion should be individualized considering the gain/loss ratio. Assessment of blood transfusion rates at regular intervals will be useful to significantly reduce the blood transfusion rate and especially the disposal rate.

Author contribution

Study conception and design: RSK, ET; data collection: BCS; analysis and interpretation of results: RSK, BCS, ET, ME; draft manuscript preparation: RSK, BCS, ET, ME. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Ethics Committee for Non-interventional Studies of Etlik Zübeyde Hanım Women's Health Training and Research Hospital (Protocol no. 04/24.04.2024).

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The authors declare that the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

Yazar katkısı

Araştırma fikri ve tasarımı: RSK, ET; veri toplama: BCS; sonuçların analizi ve yorumlanması: RSK, BCS, ET, ME; araştırma metnini hazırlama: RSK, BCS, ET, ME. Tüm yazarlar araştırma sonuçlarını gözden geçirdi ve araştırmanın son halini onayladı.

Etik kurul onayı

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Original Article

Outcomes of Fertility Sparing Surgery for Borderline Ovarian Tumors

Borderline Over Tümörlerinde Fertilite Koruyucu Cerrahi Sonuçları

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Abstract

Aim: The aim of this study was to investigate the results of fertility-preserving and/or radical surgery, the effects of fertility-preserving surgery on fertility and the postoperative recurrence rate in patients with borderline ovarian tumors.

Material and Method: The study included 138 patients who were diagnosed with borderline ovarian tumors in the oncology clinic of a tertiary institution in Ankara. The patients' data were analyzed retrospectively from the hospital information system. Among 138 patients, age, parity, type of surgery, number of lymph nodes removed, recurrence rates, pregnancy rates after treatment and fertility and recurrence analysis were performed. Recurrence and fertility rates were compared between those who underwent fertility preserving surgery and those who did not.

Results: The distribution of the patıents' age groups is as follows: 21% of the patients were under the age of 30; 26.1% were between 31-40 years of age, and 21% were between 41-50 years of age. The BMI data of the patients shows that 20.3% of the patients were in normal weight, on the contrary, 44.9% were overweight (25 kg/m2 to 29.9 kg/m2). According to the pathology results of the patients, 63% (n=87) were serous, 31.9% (n=44) mucinous, 5.1% (n=7) endometrioid type borderline ovarian tumors. Spontaneous pregnancy was observed in 31% (n=18) and pregnancy as a result of assisted reproductive techniques in 5.2% (n=3) of the patients who underwent fertility preserving surgery. According to the results of the study, it is observed that there is a statistical relationship between recurrence and fertility preservation. Recurrence was observed in 2.5% (n=2) of the individuals whose fertility was not preserved while recurrence was observed in 24.1% (n=14) of individuals whose fertility was preserved. Although it was observed that recurrence increased in patients who underwent fertility preservation surgery, it allowed pregnancy to be achieved at a rate of approximately 36%.

Conclusion: Since patients with borderline ovarian tumours are younger than patients with invasive ovarian cancer, fertility-sparing surgery is becoming increasingly important.

Keywords: Epithelial ovarian cancer; recurrence; fertility; surgery

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Öz

Amaç: Bu çalışmanın amacı borderline over tümörüne sahip hastalarda fertilite koruyucu ve/veya radikal cerrahilerin sonuçlarını, fertilite koruyucu cerrahinin fertilite üzerine etkisini ve postoperatif nüks oranlarını araştırmaktır.

Gereç ve Yöntem: Çalışmaya Ankara'da yer alan 3. basamak bir sağlık kuruluşunun onkoloji kliniğinde borderline over tümörü tanısı alan 138 hasta dahil edildi. Hastaların verileri hastane bilgi sisteminden retrospektif olarak analiz edilmiştir. 138 hastanın yaş, parite, ameliyat tipi, çıkarılan lenf nodu sayısı, nüks oranları, tedavi sonrası gebelik oranları ve doğurganlık ve nüks analizleri yapıldı. Nüks ve fertilite oranları fertilite koruyucu cerrahi uygulananlar ve uygulanmayanlar arasında karşılaştırıldı.

Bulgular: Hastaların yaş gruplarına göre dağılımı aşağıdaki gibidir: Hastaların %21'i 30 yaşın altında; %26,1'i 31-40 yaş arasında ve %21'i 41-50 yaş arasındadır. Hastaların VKİ verileri, hastaların %20,3'ünün normal kiloda olduğunu, buna karşılık %44,9'unun aşırı kilolu (25 kg/m2 ila 29,9 kg/m2) olduğunu göstermektedir. Hastaların patoloji sonuçlarına göre %63'ü (n=87) seröz, %31,9'u (n=44) müsinöz, %5,1'i (n=7) endometrioid tip borderline over tümörüdür. Fertilite koruyucu cerrahi uygulanan hastaların %31'inde (n=18) spontan gebelik, %5,2'sinde (n=3) ise yardımcı üreme teknikleri sonucu gebelik gözlendi. Çalışma sonuçlarına göre, nüks ile fertilite koruma arasında istatistiksel bir ilişki olduğu görülmektedir. Fertilitesi korunmayan bireylerin %2,5'inde (n=2) nüks gözlenirken, fertilitesi korunan bireylerin %24,1'inde (n=14) nüks gözlenmiştir. Fertilite koruma cerrahisi uygulanan hastalarda nüksün arttığı gözlense de yaklaşık %36 oranında gebelik elde edilmesine olanak sağlamıştır.

Sonuç: Borderline over tümörlü hastalar invaziv over kanserli hastalardan daha genç olduğundan, fertilite koruyucu cerrahi giderek daha önemli hale gelmektedir.

Anahtar Kelimeler: Epitelyal over kanseri; rekürrens; fertilite; cerrahi

1. Introduction

Borderline ovarian tumors (BOT) are neoplasms of epithelial origin characterized by increased cell proliferation and the presence of mild nuclear atypia, but without destructive stromal invasion (1). This group of tumors was first described by Taylor in 1929 as "semi-malignant" ovarian tumors with peritoneal involvement but surprisingly good prognosis and later recognized by the International Federation of Gynecology and Obstetrics (FIGO) in 1971 as tumors with "low malignant potential" in contrast to ovarian carcinomas (2), followed by the WHO in 1973 (3). The current 2014 WHO classification of tumors of the female reproductive organs uses the term "borderline tumor", which is interchangeable with "tumor with atypical proliferation" (4), while the previously proposed synonym "tumor of low malignant potential" is no longer recommended (5,6). The six histological subtypes of BOT are differentiated according to epithelial cell type, similar to invasive carcinomas. These include serous (50%) and mucinous (45%) and less common subtypes such as endometrioid, clear cell, seromucinous and borderline Brenner tumors (1,5).

BOTs usually have an asymptomatic course and patients are often diagnosed by pathologic examination of the intraoperative specimen. Surgical treatment of BOTs is the same as for malignant ovarian tumors except for lymphadenectomy during surgical staging (7,8). In addition to radical surgical treatment, fertility preserving conservative surgery is another option. In young women with early stage (FIGO I-II) tumors, conservative treatments are appropriate for fertility preservation as long as close follow-up is performed (9). Recurrence rates seem to have reached 75% in patients who underwent oophorectomy and cystectomy for fertility preservation (10). Prognostic factors affecting the recurrence rate include advanced stage disease, the presence of invasive tumor implants resembling low-grade serous carcinoma in serous tumors, residual tumor in fertility preserving procedures such as cystectomy or unilateral salpingo-oophorectomy, incomplete surgical staging and tumor pathologies with microinvasive or micropapillary histology (11).

As the cancer rates accelerate, more and more young people are being diagnosed with cancer. Therefore, the interest in fertility-sparing surgery is increasing. The aim of thıs study is to compare the patients who underwent fertility-sparing and those who underwent non-fertility-sparing surgery along with the effect of fertility-sparing surgery on survival and postoperative recurrence rates.

2. Material and Method

Patients were diagnosed with borderline ovarian tumor between the dates 01.01.2001 and 31.12.2020 in the Gynecologic Oncology Surgery Clinic of the Ministry of Health,

Health Sciences University Etlik Zübeyde Hanım Gynecological Diseases Training and Research Hospital between 01.01.2001 and 31.12.2020. The patients' treatment and follow-up were performed in the same hospital, so patients whose information could be accessed in the database were evaluated. Patients whose surgery and follow-up were outside this hospital and patients with synchronous or metastatic tumors were excluded from the study.

The examined patients include those who underwent fertility-sparing and those who underwent non-fertility-sparing surgeries. Fertility-sparing surgical procedures consisted of unilateral salpingo-oophorectomy (USO), in which the uterus and other ovary were preserved, and cystectomy, in which only the cyst was removed, while hysterectomy, bilateral salpingo-oophorectomy (BSO), pelvic and paraaortic lymphadenectomy, omentectomy and peritoneal biopsy were non-fertility-sparing procedures. The largest postoperative residual tumor diameter less than or equal to 1cm (R≤1cm) was considered optimal cytoreduction.

Demographic characteristics, pathology results, FIGO stages, medical and surgical treatment modalities, controls, progression-free or disease-free survival and overall survival rates of the patients were retrospectively analyzed from patient data registered in the system or electronic database and patient council files.

Postoperative treatment and follow-up of the patients were performed by the gynecology-oncology outpatient clinics in the Gynecologic Oncology Clinic of Ankara Etlik Zübeyde Hanım Training and Research Hospital Clinical examination, ultrasonography and serum CA-125 levels were measured every 3 months for the first year after the operation, every 6 months for 2 years and then annually. Patients whose last follow-up period was more than 24 months were considered lost to follow-up.

Ethics committee approval of the study was obtained from Local Ethics Committee on 21.01.2022 (Decision no: 2022/11 Date: 21.01.2022).

Statistical analysis

SPSS 24.0 was used for the statistical analysis of the data. In addition to the distributions for the variables within the scope of the study; chi-square test or Fischer's Exact test was used to test the relationship between the relevant variables. Logistic regression analysis was used to examine the presence of fertility preservation. Statistical significance was defined as $p<0.05$.

3. Results

The study included 138 patients with BOT. Of the 138 patients included in the study, 58 patients underwent fertility preserving surgery and the remaining 80 patients underwent non-fertility preserving surgery.

According to the results of the analysis, when the distribution of the demographic characteristics of the individuals was analyzed, it was seen that 21% (n=30) of the patients were under 30 years of age, 26.1% (n=36) of the patients were between 31-40 years of age at diagnosis, and 21% (n=29) of the patients were between 41-50 years of age. According to BMI data, 20.3% of the patients were of normal weight, whereas 44.9% were overweight (25 kg/m2 to 29.9 kg/m2).

Among the patients, 14 patients underwent cystectomy, 44 patients underwent USO, 79 patients underwent BSO with total abdominal hysterectomy and 1 patient underwent BSO with total laparoscopic hysterectomy. On the other hand, 60.9% (n=84) of the individuals underwent lymphadenectomy. 59.4% (n=82) underwent pelvic lymphadenectomy and 5.8% (n=7) of these patients had metastatic lymph nodes. 60.1% (n=81) of the patients underwent paraaortic lymphadenectomy. Metastatic lymph nodes were detected in 5.1% (n=6) of these patients.

When frozen histology types were analyzed, 61.6% (n=85) were serous, 34.1% (n=47) mucinous, and 4.3% (n=6) endometrioid. The final pathology result of 63% (n=87) of the individuals was serous, 31.9% (n=44) mucinous, and 5.1% (n=7) endometrioid. 76.9% (n=108) of the patients were stage IA, 1.4% (n=2) were stage IB, 11.6% (n=17) were stage 1C, 8.9% (n=5) were stage 3C. 94.9% (n=131) of the patients were followed up after the operation and 5.1% (n=7) received adjuvant CT.

Spontaneous pregnancy was observed in 31% (n=18) and pregnancy as a result of assisted reproductive techniques in 5.2% (n=3) of patients who underwent fertility preserving surgery.

In this study, demographic characteristics such as age, gravida and parity were found to be statistically significant with fertility preservation. This was considered to be due to the fact that fertility preservation surgery was more preferred in patients with younger age at diagnosis and patients with no previous gravida or parity (Table 1).

The number of patients who underwent fertility sparing surgery was fifty-eight. USO was performed in 44 of those patients and 10 of them developed recurrence. Cystectomy was performed in the remaining 14 patients and recurrence developed in 4 of

Table 1. Relationship Between Demographic Characteristics and Fertility Sparing

		Fertility Sparing				Chi-Square	p
		No		Yes			
		n	%	n	%		
Age at Diagnosis	Less than 30	2	2,5	28	48,3	**76,541**	**0,000***
	31-40	12	15	24	41,4		
	41-50	24	30	5	8,6		
	51-60	32	40	1	1,7		
	More than 60	10	12,5	0	0		
Gravidity (Number of Pregnancy)	0	7	8,8	21	36,2	**37,914**	**0,000***
	1	4	5	11	19		
	2	16	20	10	17,2		
	3	18	22,5	13	22,4		
	4	15	18,8	3	5,2		
	More than 5	20	25	0	0		
Parity (Number of Births)	0	8	10	24	41,4	**38,302**	**0,000***
	1	5	6,3	12	20,7		
	2	24	30	11	19		
	3	21	26,3	11	19		
	More than 4	22	27,5	0	0		
Alive	0	8	10	23	39,7	**36,207**	**0,000***
	1	6	7,5	13	22,4		
	2	23	28,8	12	20,7		
	3	22	27,5	10	17,2		
	More than 4	21	26,3	0	0		

*p<0,05

them. In the group of patients who did not undergo fertility sparing surgery, recurrence developed in 2 patients. 3 of our 14 patients who underwent fertility sparing surgery and had recurrence had peritoneal implants. In 11 patients, recurrence was seen in the contralateral ovary, 1 patient had recurrence in the ipsilateral ovary, and 2 patients had recurrence in bilateral ovaries.

According to the results of the study, it is observed that there is a statistical relationship between recurrence and fertility preservation. While 2.5% (n=2) of individuals without fertility preservation had recurrence, 24.1% (n=14) of individuals with fertility preservation had recurrence. The incidence of recurrence is 12 times higher in those with fertility sparing compared to those without fertility sparing. The pathologies of the patients who recurred in this study show that while the pathologies of 14 of 16 patients were reported as serous borderline tumors, the recurrent pathologies of these patients were reported as serous borderline tumors. While 2 of them were reported as mucinous borderline tumors, their recurrent pathologies were reported as mucinous bordeline tumors. While 9 of the patients who developed recurrence after fertility sparing surgery developed recurrence within the first 1 year, 1 of the 2 patients who did not undergo fertility sparing surgery developed recurrence after 17 years, and the other patient developed recurrence after 9 years (Table 2).

Table 2. Relationship Between Recurrence and Fertility Sparing

			Fertility Sparing		Total	Chi-Square	p
			No	Yes			
Recurrence	No	n	78	44	122	**13,320**	**0,000***
		%	97,5%	75,9%	88,4%		
	Yes	n	2	14	16		
		%	2,5%	24,1%	11,6%		
Total		n	80	58	138		
		%	100,0%	100,0%	100,0%		

*p<0,05

4. Discussion

BOTs are more common in young women and have a much better prognosis than invasive tumors (12). The fact that most of the patients are young increases the interest in fertility sparing surgery. In this study, 47% (n=66) of the patients with BOTs were under 40 years of age. In a Swedish study investigating the diagnosıs age patients diagnosed with BOT between 1960 and 2005, 34% of the patients were found to be under 40 years of age (13). In another study conducted by Boran et al. 56% of the study group consisted of patients whose age at diagnosis was below 40 years (14). BOTs generally have a low malignant potential. Most of them are diagnosed at early stages and are seen as stage-I according to FIGO staging (12). Being confined to the ovary and hiding invasion is the reason behind this phenomenon. In the study, 89.9% of the patients were stage-1 and 10.1% were stage 2-3. The pathology results of the patients were reported as serous borderline in 63%, mucinous borderline in 31.9% and endometrioid borderline in 5.1%.In the study by Tinelli et al. 80% of the patients were reported as stage-1, while the rate of patients reported as stage-3 was 8% (15).

In this study, 60.9% of the individuals underwent lymphadenectomy. 59.4% underwent pelvic lymphadenectomy and 5.8% of these patients had metastatic lymph nodes. 60.1% of the patients underwent paraaortic lymphadenectomy. Metastatic lymph nodes were detected in 5.1% of these patients. In this study, there was no significant difference in terms of recurrence between patients who underwent lymphadenectomy and those who did not. Whether or not lymphadenectomy should be performed in patients is still controversial. In a meta-analysis of 12503 patients in 25 studies by Fan et al., lymph node metastasis was found to affect recurrence but not survival. Similarly, it was concluded that lymphadenectomy did not affect recurrence rates (16).

In another study by Camatte et al., patients diagnosed with early stage BOT were compared with those who had completed and incomplete staging. While a recurrence rate of 8% was observed in patients with incomplete staging, no recurrence was observed in patients with complete staging. However, in this study, it was observed that staging had no effect on survival in patients with significant stage-1 disease. As suggested at the end of the study, staging may not be performed in patients who are sure that there is no micropapillary pattern and who are suitable for follow-up (17). In other studies, it was observed that routine staging in stage-1 patients did not make a significant difference on recurrence and survival (18). For now, the best approach seems to be to explain the options to the patient and share the responsibility.

Fertility sparing surgery was performed in 58 patients in the study. Pregnancy was observed in 21 of the patients who underwent fertility sparing surgery. Of these patients, 18 conceived spontaneously and 3 conceived with assisted reproductive techniques. When the pregnancy outcomes were analyzed, it was observed that 12 pregnancies reached live birth, 8 pregnancies had no follow-up information and 1 pregnancy resulted in abortion. In another study by Donez et al. pregnancy rates were found to be 63.6% (19). As in this study, the possibility of learning the fertility wishes of the patients in prospective studies makes the studies more valuable than retrospective studies. The main aim of conservative surgery is to preserve the fertility potential in young women. According to the results of the study, pregnancy rates obtained after treatment were high in BOTs.

There are many studies evaluating recurrence after treatment of BOTs. Fertility-sparing surgery may be considered as a valid treatment option because of the good prognosis of patients with early-stage ovarian cancer. Many studies have shown that

although conservative surgery increases recurrence rates, it does not worsen survival. 24.1% of the patients in the study who underwent fertility-sparing surgery had recurrence. In another study conducted by Boran et al. among 142 patients, recurrence was observed in 6.5% of patients who underwent fertility-sparing surgery, while this rate was 0.0% in patients who did not undergo fertility-sparing surgery (14). Compared to radical surgery, fertility sparing surgery increased the recurrence rates, similar to other reports in the literature. If we look at the rates in the literature, the recurrence rate after fertility sparing surgery is between 5% and 34%, while the recurrence rate after radical surgery is between 3.2% and 7% (20,21).

In a prospective study by Zanetta et al. 35 of 189 patients who underwent fertility-sparing surgery recurred, while only 7 of 150 patients who underwent radical surgery developed recurrence. Although the recurrence rate seems to be higher in fertility-sparing surgery, the recurrent patients were detected in stage-1 (22). In our study, the number of patients in whom we performed fertility-sparing surgery was 58. Among these patients, the recurrence rate after cystectomy was 28.5%, while the recurrence rate after unilateral oophorectomy was 22.7%. In a meta-analysis by Vasconcelos et al. the recurrence rates after cystectomy and unilateral oophorectomy were 25.3% and 12.5%, respectively (23). In the literature, the recurrence rate after cystectomy varies between 12% and 36.3%. The recurrence rate after unilateral oophorectomy also varies between 7.2% and 25% (24-26).

The weakness of the study is that the fertility intention of the patients could not be determined precisely because it was retrospective. Another weakness of the study is the limited follow-up period and the limited information obtained from the referrals when evaluating the development of recurrence. If we talk about the strengths of the study; it is aimed to contribute to the literature by studying a subject such as fertility preservation, which is still open to controversy, with the largest and homogeneous patient group possible.

5. Conclusion

Since patients with BOTs are younger than patients with invasive ovarian cancer, fertility-sparing surgical approaches are becoming increasingly important when discussing treatment options. With the widespread use of conservative surgery, issues such as reducing postoperative morbidity, and recurrence complicate the management of this treatment option. As a result of despite the high live pregnancy rates in patients undergoing fertility preserving surgery, the most appropriate approach should be planned by explaining all options to the patient, when the increased recurrence rate in these patients is considered.

Author contribution

Study conception and design: DSK, NB, ASDÇ; data collection: DSK, AK; analysis and interpretation of results: DSK, AK; draft manuscript preparation: DSK. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Ethics Committee for Noninterventional Studies of Etlik Zubeyde Hanım Women Health Education Research Hospital (Protocol no. 1/11 - 21.01.2022).

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Conflict of interest

The authors declare that there is no conflict of interest.

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Türk Kadın Sağlığı ve Neonatoloji Dergisi

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Original Article

The Relationship Between Preoperative Glycosylated Hemoglobin Levels and Postoperative Wound Complications in Diabetic Patients Undergoing Hysterectomy

Histerektomi Operasyonu Geçiren Diyabetik Hastalarda Preoperatif Glikolize Hemoglobin Seviyesi ile Postoperatif Yara Yeri Komplikasyonları Arasındaki İlişki

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Abstract

Objective: The aim of this study is to investigate whether there is a relationship between glycosylated hemoglobin (HbA1c) and wound complications in diabetic women who have undergone hysterectomy for benign reasons.

Material and Methods: Our retrospective observational study included 153 patients with diabetes mellitus and 154 women without diabetes mellitus who underwent total abdominal (open) hysterectomy for benign reasons at the Gynecology Clinic of Health Sciences University Etlik Zübeyde Hanım Women's Diseases Training and Research Hospital between January 2016 and November 2022. The HbA1c level and the preoperative fasting blood glucose level were evaluated in 2 groups as patients with and without wound complication. These values were compared with the significance of the results of complications at the wound site.

Results: The study included 307 patients who underwent hysterectomy. All patients underwent open hysterectomy and preoperative 2 g of cefazolin was administered intravenously prophylactically. When the presence of comorbidities (comorbidities other than diabetes mellitus) was analyzed to assess the general health of the patients, a significant difference was found between the groups ($p<0.001$). 42.2% of patients in the control group and 99.3% of patients in the study group had a diagnosis for a comorbid condition. The HbA1c level and fasting blood glucose level before surgery were not statistically significant in distinguishing wound complications ($p=0.588$ and $p=0.967$, respectively). The postoperative 1st day White blood cell (WBC) count was higher in the study group than the control (12611.38±3287.71 vs. 11075.18±3032.68, p 0.013).

Conclusion: In our study, no significant association was found between HbA1c levels and wound complications in patients undergoing hysterectomy for benign reasons. However, it was found that the postoperative 1st day WBC count had predictive value for the wound complication in this population.

Keywords: Glycosylated haemoglobin (HbA1c); blood glucose level; hysterectomy; surgical site infection

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Öz

Amaç: Bu çalışmanın amacı, benign nedenlerle histerektomi geçiren diyabetik kadınlarda glikolize hemoglobin (HbA1c) ile yara komplikasyonları arasında bir ilişki olup olmadığını araştırmaktır.

Gereç ve Yöntemler: Retrospektif gözlemsel çalışmamıza Ocak 2016- Kasım 2022 tarihleri arasında Sağlık Bilimleri Üniversitesi Etlik Zübeyde Hanım Kadın Hastalıkları Eğitim Araştırma Hastanesi jinekoloji kliniğinde benign nedenler ile total abdominal (açık) histerektomi yapılan ve diabetes mellitus tanısı olan 153 hasta çalışma grubu, diabetes mellitus tanısı olmayan 154 hasta kontrol grubu olarak dahil edilmiştir. HbA1c düzeyi ve ameliyat öncesi açlık kan şekeri düzeyi, yara komplikasyonu olan ve olmayan hastalar olarak 2 grupta değerlendirildi. Bu değerler yara yerindeki komplikasyonların sonuçlarının anlamlılığı ile karşılaştırıldı.

Bulgular: Çalışmaya histerektomi yapılan 307 hasta dahil edildi. Tüm hastalara açık histerektomi yapıldı ve ameliyat öncesi profilaktik olarak 2 g sefazolin intravenöz olarak uygulandı. Hastaların genel sağlığını değerlendirmek için komorbidite (diabetes mellitus dışındaki komorbiditeler) varlığı analiz edildiğinde, gruplar arasında anlamlı bir fark bulundu ($p<0.001$). Kontrol grubundaki hastaların %42,2'si ve çalışma grubundaki hastaların %99,3'ü komorbid bir durum için tanı almıştır. Ameliyat öncesi HbA1c düzeyi ve açlık kan şekeri düzeyi yara komplikasyonlarını ayırt etmede istatistiksel olarak anlamlı değildi (sırasıyla $p=0.588$ ve $p=0.967$). Ameliyat sonrası 1. gün beyaz kan hücresi (BK) sayısı çalışma grubunda kontrol grubuna göre daha yüksekti (12611.38±3287.71 vs. 11075.18±3032.68, p 0.013).

Sonuç: Çalışmamızda, benign nedenlerle histerektomi yapılan hastalarda HbA1c düzeyleri ile yara komplikasyonları arasında anlamlı bir ilişki bulunmamıştır. Bununla birlikte, postoperatif 1. gün WBC sayısının bu popülasyonda yara komplikasyonu için prediktif değeri olduğu bulunmuştur.

Anahtar Kelimeler: Glikolize hemoglobin (HbA1c); kan şekeri düzeyi; histerektomi; cerrahi alan enfeksiyonu

1. Introduction

Wound complications (surgical site infections (SSIs), wound dehiscence, delayed wound healing, etc.) can impair healing of the surgical incision, prolong hospitalization and treatment time, and increase treatment costs; severe infections can have a negative impact on patient mortality and morbidity (1,2). SSIs are responsible for 22% of all hospital-acquired infections (3). Hysterectomy is one of the most commonly performed operations in women. In SSIs following hysterectomy, infectious agents can originate from both the patient's skin and the vaginal canal (4). The diversity of infectious agents is one of the factors influencing the width of antibiotics to be used in treatment and the success of treatment. The incidence of SSI after hysterectomy is 9-10% (5,6). In addition, open abdominal procedures have a higher risk of SSI than laparoscopic or vaginal procedures (7-9).

Known risk factors for wound complications include age, American Society of Anaesthesiology Classification (ASA) score, diabetes mellitus, smoking, previous surgery, previous infection, chronic skin disease, amount of intraoperative blood loss and duration of surgery. Diabetes mellitus is a systemic disease that alters blood glucose metabolism and is one of the most common risk factors for postoperative wound infections (10-12). There are numerous studies demonstrating the impact of hyperglycemia on postoperative outcomes. Most of these studies have focused on determining the ideal preoperative HbA1c level and blood glucose level for a low complication rate in elective surgery (13-16).

Recent studies have shown the usefulness of measuring HbA1c prior to surgery to identify diabetic patients and have found that HbA1c levels were high in patients with infections (17,18). Studies in the literature have shown a positive correlation between HbA1c levels and surgical site infection rates. Adequate glycemic control and monitoring of levels are critical in the management of SSI (19,20).

The aim of this study is to contribute to the limited knowledge in the literature on this topic and to investigate whether there is an.

2. Materials and Methods

Our retrospective cross-sectional observational study included 153 patients with diabetes mellitus and 154 patients without diabetes mellitus who underwent hysterectomy for benign reasons at the Gynecology Clinic of University of Health Sciences Etlik Zübeyde Hanım Women's Health Training and Research Hospital between January 2016 and November 2022.

The patients' data were scanned retrospectively from the patient record system. The study protocol was approved by the Medical Speciality Education Board of University of Health Sciences Etlik Zübeyde Hanım Women's Health Training and Research Hospital (Decision No.: 16/26.12.2022). Demographic and clinical characteristics were obtained from the patients' medical records. Age, parity, body mass index (BMI), history of comorbidities, history of diabetes mellitus, medications, indication for surgery, type of abdominal incision (Pfannenstiel, median umbilicus, Maylard, etc.), presence of complications during surgery, history of blood transfusion, preoperative HbA1c level, preoperative hemoglobin (Hb) and white blood cell (WBC) levels, postoperative Hb and WBC levels at 24 hours. The following information was obtained from the medical records: postoperative Hb and WBC values at 24 hours, length of hospital stay, presence of complications at the wound site (wound dehiscence, discharge, infection), culture result and treatment method of the complication, if applicable, and the values obtained were recorded in the patient's follow-up form.

The wound cultures were analyzed in our hospital's microbiology laboratory. Swabs or infected swab samples from the wound site were cultured on chocolate agar, blood agar and emb agar and observed for 48 hours. If colonies were detected, slides were removed and the culture of the wound site was considered positive on microscopic examination if bacteria and leukocytes were present and examined for antibiogram studies.

Patients with and without diabetes mellitus (n:307) underwent laparotomy (open hysterectomy). The operations were performed under general anesthesia. During surgery, electrocardiogram, airway pressure and blood oxygen were monitored, urinary catheters and other devices were placed. All patients participating in the study received 2 g of cefazolin intravenously preoperatively (within 30 minutes before the start of surgery) as prophylaxis against surgical site infections. HbA1c levels and preoperative fasting blood glucose levels were evaluated and these values were compared with the significance of wound healing complication outcomes. Wound cultures were obtained in 15 of the patients (n:16) in whom wound complications (subcutaneous dehiscence of the skin, fascial dehiscence, discharge, infection, evisceration) were noted. Patients (n:8) who were found to have growth in the wound culture were considered positive for surgical wound infection. Patients who had undergone surgery for malignant diseases, patients who had undergone laparoscopic or vaginal surgery were not included in the study.

Statistical analysis

The data were analyzed using IBM SPSS V23. Agreement with the normal distribution was analyzed by Shapiro-Wilk and Kolmogorov-Smirnov tests. The chi-square test, Yates correction, Fisher's exact test and Fisher-Freeman-Halton test were used to compare categorical data by group. The Mann-Whitney U test was used to compare non-normally distributed data by binary groups. ROC analysis was used to determine the cut-off value of parameters to discriminate wound complication. Binary logistic regression analysis was used to analyze the risk factors influencing complications at the wound site. The significance level was set at $p<0.050$.

3. Results

The distribution of the demographic and clinical characteristics of the patients included in the study across the individual groups is shown in Table 1. Menopausal status differed between the groups (p=0.006). 27.7% of the control group and 43% of the study group were postmenopausal. When the presence of comorbidities (comorbidities other than diabetes mellitus) was analyzed to assess the general health status of the patients, a significant difference was found between the groups (p<0.001). 42.2% of the patients in the control group and 99.3% of the patients in the study group had a diagnosis of comorbidity. It was observed that 29.3% (n:90) of the participants had no comorbidity. These comorbidities included hypertension 55.7%, heart disease 2.7%, thyroid disease 20.1%, asthma 6.8% and others 2.7%. Indications for operation also differed between the groups (p=0.004). This difference is due to the difference in the indications for myoma uteri, hyperplasia without atypia and hyperplasia with atypia. 48.7% of the patients in the control group and 33.1% of the patients in the study group were operated for myoma uteri, 0% of the control group and 3.9% of the study group were operated for hyperplasia without atypia, 24.7% of the control group and 37% of the study group were operated for hyperplasia with atypia. The median ages differed between the groups (p=0.001). While the median age of the control group was 50.00 years, the median age of the study group was 51.50 years. The median parity differed according to the groups (p=0,005). While the median parity of the control group was 2.00, the median parity of the study group was 3.00. No significant difference was found between the distributions of other variables (p>0.050).

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Table 1. Comparison of demographic characteristics and clinical results according to groups				
	Control N=154	Study N=153	Total	p
Age (years)	51.10±6.77	53.81±7.91	52.45±7.47	**0.001*****
Parity	2.53±1.36	2.97±1.32	2.76±1.36	**0.005*****
Postmenopause				
No	107 (72.3)	88(57)	193 (64.5)	**0.006***
Yes	41 (27.7)	65 (43)	106 (35.5)	
Body Mass Index (BMI)				
<30	15 (26.3)	14 (22.2)	29 (24.2)	0.757**
>30	42 (73.7)	49 (77.8)	91 (75.8)	
Comorbidities				
No	89 (57.8)	1 (0.7)	90 (29.3)	**<0.001***
Yes	65 (42.2)	152 (99.3)	217 (70.7)	
The reason for hysterectomy				
Fibroids	75 (48.7)a	51 (33.1)b	126 (40.9)	**0.004********
Treatment-resistant bleeding	13 (8.4)	11 (7.1)	24 (7.8)	
Adnexal mass	28 (18.2)	29 (18.8)	57 (18.5)	
Hyperplasia without atypia	0 (0)a	6 (3.9)b	6 (1.9)	
Atypical hyperplasia	38 (24.7)a	57 (37)b	95 (30.8)	
Abdominal incision type				
Phannelstiel	86 (55.8)	72 (46.8)	158 (51.3)	0.296****
Sub-umbilical median incision	49 (31.8)	60 (39)	109 (35.4)	
Abdominal median incision	19 (12.3)	21 (13.6)	40 (13)	
Maylard	0 (0)	1 (0.6)	1 (0.3)	
Complications				
No	148 (96.7)	149 (97.4)	297 (97.1)	1.000***
Yes	5 (3.3)	4 (2.6)	9 (2.9)	
Surgical site infection				
No	140 (91.5)	138 (89.6)	278 (90.6)	0.710**
Yes	13 (8.5)	16 (10.4)	29 (9.4)	
Wound site complication				
Subcutaneous skin opening	2 (15.4)	4 (25)	6 (20.7)	0.757****
Opening Fascia	1 (7.7)	0 (0)	1 (3.4)	
Discharge	6 (46.2)	5 (31.3)	11 (37.9)	
Infection	3 (23.1)	6 (37.5)	9 (31)	
Evisseration	1 (7.7)	1 (6.3)	2 (6.9)	

*Chi-square test, **Yates correction, ***Fisher's Exact test, ****Fisher-Freeman-Halton test, *****Mann-Whitney U test, frequency (percentage), mean±standard deviation, median (minimum - maximum).

Table 1. Continued				
	Control N=154	Study N=153	Total	p
Wound site culture				
No	141 (91.6)	139 (90.3)	280 (90.9)	0.843**
Yes	13 (8.4)	15 (9.7)	28 (9.1)	
Wound culture results				
No growth	144 (94.7)	143 (94.7)	287 (94.7)	1.000**
Growth+	8 (5.3)	8 (5.3)	16 (5.3)	
Breeding microorganism				
E coli	1 (14.3)	2 (22.2)	3 (18.8)	
Enterococcus spp	0 (0)	1 (11.1)	1 (6.3)	
Klebsiella	1 (14.3)	0 (0)	1 (6.3)	
Coagulase-negative Staphylococcus aureus	1 (14.3)	0 (0)	1 (6.3)	
Proteus	0 (0)	1 (11.1)	1 (6.3)	
Pseudomonas aeruginosa	1 (14.3)	0 (0)	1 (6.3)	
Serratia marcescens	0 (0)	1 (11.1)	1 (6.3)	
Staphylococcus aureus	0 (0)	1 (11.1)	1 (6.3)	
Staphylococcus spp	1 (14.3)	0 (0)	1 (6.3)	
*Chi-square test, **Yates correction, ***Fisher's Exact test, ****Fisher-Freeman-Halton test, *****Mann-Whitney U test, frequency (percentage), mean±standard deviation, median (minimum - maximum).				

The AUC value (area under the curve) of preoperative fasting blood glucose to discriminate wound site complications was 0.459 and the AUC value was not statistically significant (p=0.588). The AUC value of preoperative HbA1c to discriminate wound site complications was 0.497 and the AUC value was not statistically significant (p=0.967) (Table 2).

There was no significant difference between the medians of preoperative fasting blood glucose and HbA1c values according to wound complication (p-values 0.588 and 0.967, respectively) (Table 3).

Risk factors affecting wound complications were analyzed using a binary logistic regression analysis as a univariate model. Increased WBC is an indicator of infection and inflammatory process, and as a result of the univariate model, it was found that the higher the Wbc, the 6.467-fold increase in the risk of wound complication (p=0.013). As the length of hospitalization increased, the risk of wound complications increased 1.252-fold (p=0.001). Other variables had no statistically significant effect (p>0.050) (Table 4).

Table 2. ROC analysis of preop fasting glucose and HbA1c parameters in predicting wound complications in the study group

	AUC (%95 CI)	p
Preoperative glucose	0.459 (0.272 – 0.645)	0.588
Preoperative glycated haemoglobin (HbA1c)	0.497 (0.328 – 0.665)	0.967

Table 3. Comparison of preop fasting blood glucose and HbA1c values according to wound complication

	Wound site complication		p
	No	Yes	
Preoperative glucose	143.38±47.7	147.69±72.34	0.588
Preoperative glycated haemoglobin (HbA1c)	7.14±1.24	7.17±1.36	0.967

Table 4. Examination of risk factors affecting wound complications				
	Wound site complication		Univariate	
	No	Yes	OR (%95 CI)	p
Age (years)	52.31±7.40	53.83±8.25	1.026 (0.978 – 1.076)	0.300
Postmenopause				
No	177 (91.7)	16 (8.3)	-	
Yes	93 (87.7)	13 (12.3)	1.546 (0.713 – 3.352)	0.269
Body Mass Index (kg/m^2)				
<30	28 (96.6)	1 (3.4)	-	
≥30	83 (91.2)	8 (8.8)	2.699 (0.323 – 22.541)	0.359
Preoperative glucose	123.92±41.82	125.38±59.22	1.001 (0.992 - 1.009)	0.864
Preoperative hemoglobin	12.39±1.70	12.66±1.64	1.099 (0.871 - 1.386)	0.425
Postoperative 1 st day hemoglobin	10.58±1.48	10.91±1.37	1.166 (0.896 - 1.516)	0.254
Postoperative 1 st day white blood cell count	11075.18±3032.68	12611.38±3287.71	6.467 (1.478 - 28.306)	**0.013**
Hospitilization (days)	3.48±1.58	5.31±4.75	1.252 (1.101 - 1.424)	**0.001**

4. Discussion

It is well known that hysterectomy significantly affects women's physical and mental health, apart from the economic burden it entails. SSIs affect the body tissues, cavities and organs invaded during surgery and usually occur within 30 days of the surgical procedure (21). Risk factors for SSI include age, obesity, malnutrition, low socioeconomic status, preoperative anemia, and comorbidities such as diabetes and hypertension (6,22-24). A summary of results in risk faktors for SSI in Table 5. Many factors for SSI are thought to be modifiable during the surgical procedure (4), and prophylactic use of antibiotics is known to be important for prevention (6). The Centers for Disease Control and Prevention (CDC) guidelines (25) recommend prophylactic administration of antibiotics less than 30 minutes before the start of surgery, repeated administration of antibiotics if blood loss exceeds 1.5 liters or the duration of surgery exceeds 3 hours, and adequate control of concomitant diseases such as diabetes mellitus (6,26). Our study is a single-center study and we think that the implementation of CDC guideline recommendations in our hospital is one of the reasons for our low SSI rate.

Göksever Çelik et al. found that the percentage of SSI was higher in patients who underwent abdominal hysterectomy than in patients who underwent laparoscopic and vaginal hysterectomy (6). In addition, Lake et al. found that the risk of postoperative cellulitis was higher after an abdominal hysterectomy than after a vaginal approach (7). The finding the decreased occurrence of superficial SSI after vaginal approach for hysterectomy reaffirms the long appreciated role for vaginal hysterectomy as the route of choice for hysterectomy (27). All patients in our study underwent abdominal hysterectomy. Although there was no difference in the surgical method, no significant association was found between wound complications and the difference in the type of abdominal incision.

Blankush et al. have shown that preoperative HbA1c levels in 2200 patients undergoing non-emergency procedures, although not independently associated with the risk of postoperative infection, may still be useful in predicting increased risk of infection (28). Werner et al. analyzed data from 7958 diabetic patients undergoing open surgery for carpal tunnel syndrome and found that elevated HbA1c levels were associated with an increased rate of SSI in patients with perioperative HbA1c levels between 7 and 8 mg/dL (29). In addition, perioperative glycemic control was found to be as important as preoperative HbA1c and blood glucose levels in terms of SSI prevention (30,31). Wang et al. showed that preoperative HbA1c was the best predictor of SSI (13). In our study, HbA1c and blood glucose values were analyzed, but no statistically significant association was found in relation to wound complications. Our study showed that wound complications in diabetic patients cannot be predicted by HbA1c levels.

Table 5. Summary of results from different studies for SSI risk factors

Authors and year	Aim of study	Study design	Sample size	Study population	Risk factors for SSI
Goksever Celik et al., 2017	To define the clinical and labora-tory characteristics of patients who had SSI after hysterectomy	Retrospective cohort study	840	Patients who have undergone hysterec-tomy and reported postoperative SSI	High BMI, blood loss during surgery, low hematocrit level and associated anemia
Lake et al., 2013	Estimating the occurrence of SSI after hysterectomy and the associ-ated risk factors	Cross-sectional analysis	13822	Women undergoing hysterectomies performed by gyne-cologic services	The hysterectomy method (laparotomy), length of surgery time, American Society of Anesthesiologist Class ≥ 3, body mass index ≥ 40kg/m2, and diabetes
Mahdi et al., 2014	Estimating the rate and predictors of SSI after hysterectomy and to identify any association between SSI and other postoperative comp-lications	Retrospective cohort study	758	Patient who un-derwent hysterec-tomy due to benign indications from 2005 to 2011	Blood transfusion, longer operative time (> 3 hours), local tissue trauma , higher glycemic and thermal dysregu-lation, and breaking sterile techniques
Lenz et al., 2016	The risk factors and outcome after coronary artery bypass grafting in diabetic patients	Retrospective analysis	590	Patient in the cardio-vascular surgery clinic	Diabetic, pre- and perioperati-ve management of the blood-glucose level, obesity
Sharif et al., 2019	Summarising current sternal wound infection literature diagno-sing	Literature review	-	Patients with sternal wound infection	Body mass index ≥ 30 kg/m2, peripheral vascular disease, chronic obstructive pulmonary disease, DM
Wang et al., 2022	Perioperative blood glycemic monitoring for the incidence of SSI among patients with type II DM during the 1-year follow-up after emergent orthopedic surgery	Retrospective, observational study	604	Patients with type II DM older than 50 years old and who received surgery for a lower limb fractu-re	Preoperative HbA1c > 7.85%, postoperative HbA1c > 6.65%, preoperative blood glucose > 130.50 mg/dl, postoperative blood glucose > 148.5 mg/dL, rheumatoid arthritis
Frisch et al., 2010	To determine the effect of periope-rative hyperglycemia on clinical outcomes in general and non-cardiac surgery patients	Retrospective observational study	3184	All patients who underwent inpatient noncardiac surgical procedures	Perioperative hyperglycemia significantly increased the risk of pneumonia, systemic blood infections, urinary tract infec-tion, skin infections during the postoperative period
Jämsen et al., 2010	Analyzing of preoperative scree-ning for hyperglycemia in identif-ying patients predisposed to infec-ted knee replacement	Retrospective study	1565	Patients undergoing primary total knee replacement due to osteoarthritis	Obesity and hyperglycemia

Table 5. Continued

Authors and year	Aim of study	Study design	Sample size	Study population	Risk factors for SSI
Carranza-Lira et al., 2020	To compare the concentration of HbA1c between patients with and without SSI after hysterectomy	Prospective, cross-sectional and comparative study	47	Postoperative wo-men with total ab-dominal (open) hysterectomy	HbA1c > 5.7%
Gatti et al., 2016	Investigating the prevalence of increased HbA1c and its impact on the development of SWI in patients undergoing isolated coro-nary artery bypass grafting	Prospective study	2130	All patients of enrol-led E-CABG and undergoing surgery	HbA1c >70 mmol/mol (8.6%)
Shi et al., 2021	To analyze the potential risk fac-tors of SSI in patients with endo-metrial carcinoma	Retrospective study	318	Patients with endo-metrial carcinoma who underwent surgery treatment	the longer drainage of the surgical site, late removal of the drainage tube after surgery, postoperative serum albu-min < 30 g/L, postoperative blood glucose ≥ 10 mmol/L
Lachiewicz et al., 2015	The risk factors for developing SSI following a gyne-cological procedure	Literature review	-	Patients undergoing gynecological sur-gery	Obesity, extended procedure (≥3 hours) or with a total blood loss ≥1500 mL, hyste-rectomy with the abdominal method, failure to prepare the skin and vagina before sur-gery, DM(particularly periope-rative serum glucose le-vels>150 mg/dL and preopera-tive hemoglobin HbA1c> 6.5%)
Blankush et al., 2016	The correlation between elevated pre-operative HbA1c and post-operative infections	Retrospective study	2200	Patients undergoing non-emergent proce-dures	Age, surgical risk classifica-tion, and wound classification (clean, clean/contaminated, contaminated, dirty)
Werner et al., 2019	The association of HbA1c levels in diabetic patients with the incidence of SSI fol-lowing open carpal tunnel release	Retrospective study	7958	Patients who un-derwent open CTR	perioperative HbA1c between 7 and 8 mg/dL
Molina et al., 2015	To evaluate risk factors of deep infection following pilon fractures	Retrospective study	400	All patients with pilon fractures	Open fractures, hypertension and male gender

There are many studies in the literature with different opinions on the relationship between BMI and the development of SSI. Some previous studies have reported that patients with higher BMI have thicker subcutaneous adipose tissue, poorer blood supply to the adipose tissue, and are prone to fat necrosis, which is associated with the development of SSI (32,33). In contrast to the results of these studies, Shi et al. found no association between BMI and SSI in their study (19). In our study, no statistically significant association was found between BMI and wound complication. This could be related to the small sample size. Prospective studies with larger sample sizes are needed in the future to confirm our findings.

Our study showed that wound complications cannot be predicted by HbA1c levels. However, we believe that perioperative blood glucose regulation and control is important for the patient's healing process and that blood glucose regulation accelerates wound tissue healing time even if there are no complications at the wound site. For this reason, we recommend determining the perioperative HbA1c level and regulating blood glucose levels when blood glucose levels are high. The small number of patients and the retrospective design are the weaknesses of our study. The strengths of our study are that the patients were treated and followed up in a tertiary center and that their information was complete and accessible in the data system. We need a larger number of patients and further investigation to determine whether there is a significant association between HbA1c levels and wound complications in diabetic women undergoing hysterectomy for benign reasons.

In conclusion, no significant association was observed between HbA1c levels and wound complications in diabetic women undergoing hysterectomy for benign reasons. However, the postoperative 1st day WBC count had predicitive value for wound complication in this population.

Author contribution

Study conception and design: TK, EA, KD, EÜ; data collection: KD, EÜ, EA, FK; analysis and interpretation of results: KD, SK, FK, TK; draft manuscript preparation: KD, EÜ, TK, SK, FK, YEÜ. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Ethics Committee for Non-Interventional Studies of Etlik Zubeyde Hanim Women Health Education Research Hospital (Protocol no. 16/26.12.2022).

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Conflict of interest

The authors declare that there is no conflict of interest.

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Araştırma fikri ve tasarımı: TK, EA, KD, EÜ; veri toplama: KD, EÜ, EA, FK; sonuçların analizi ve yorumlanması: KD, SK, FK, TK; araştırma metnini hazırlama: KD, EÜ, TK, SK, FK, YEÜ. Tüm yazarlar araştırma sonuçlarını gözden geçirdi ve araştırmanın son halini onayladı.

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Olgu Sunumu

Vezikoamniyotik Şant Uygulanan Bir Fetal Megasistis Olgusu

A Case of Fetal Megacystis in Which Vesicoamniotic Shunt Was Applied

Neval Çayönü Kahraman *[1]

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Öz

Amaç: Fetal megasistis ve alt üriner sistem obstrüksiyonunun (LUTO) prenatal tanı, tedavi ve yönetiminin önemini belirlemek

Gereç ve Yöntem: Prenatal megasistis tanısı alan bir fetüsün intrauterin cerrahi tedavisi ile yönetimini sunmayı planladık. Gebeliğin ikinci trimesterinde fetal megasistis tanısı alan fetüse amniosentez yapılmış, tedavi için vezikoamniyotik şant (VAS) cerrahisi yapılmıştır. Tedaviye rağmen VAS' ın dislokasyonu sonrası anhidroamnios gelişen ve megasistisi devam eden 18 haftalık fetüste terminasyon yapılmıştır.

Sonuç: LUTO'nun prenatal tanısında ultrason bulgularının tanınması ve VAS tedavisinden fayda görecek olguları seçmenin önemini vurgulamak istedik.

Anahtar Kelimeler: Megasistis; alt üriner sistem obtrüksiyonu (LUTO); oligohidroamniyoz; fetal hidronefroz; vezikoamniyotik şant

Abstract

Objective: To determine the importance of prenatal diagnosis, treatment and management in the fetal megacystis and lower urinary tract obstruction (LUTO).

Material and Method: We planned to present the management of a fetus diagnosed with prenatal megacystis through intrauterine surgical treatment. Amniocentesis was performed on the fetus diagnosed with fetal megacystis in the second trimester of pregnancy and vesicoamniotic shunt (VAS) surgery was performed for treatment. Termination was made in the 18 gestational week fetus who developed anhydroamnios and continued megacystis after VAS dislocation despite treatment.

Conclusion: We wanted to emphasize the importance of recognizing ultrasound findings in the prenatal diagnosis of LUTO and selection cases that will benefit from VAS treatment.

Keywords: Megacystis; lower urinary tract obstruction (LUTO); oligohydroamnios; fetal hydronephrosis; vesicoamniotic shunt

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1. Giriş

Megasistis, birinci trimesterde fetüs idrar üretmeye başladıktan sonra sonografik olarak genişlemiş mesane olarak tanımlandırılmaktadır (1). Ultrasonda mesane longitudinal çapının ≥ 7 mm olması olarak tanımlanır; birinci trimesterde prevalansı 1/1500 olarak tahmin edilmektedir (1). Bu bulgu, mekanik veya fonksiyonel fetal LUTO'u düşündürmektedir (2). Fetüs ve etkilenen çocuğun uzun vadeli sağlığı üzerine yıkıcı bir etkisi olabilmekte; bu yüzden fetal sonuçları iyileştirmek için tanı ve tedavide ilerleme gerektiren önemli morbitide ve mortaliteye sahip karmaşık bir fetal genitoüriner sistem bozukluğudur (3). Fetal LUTO etyopatogenezi fetal üriner sistem yollarının gelişimi sırasında mesane çıkış obstruksiyonuna bağlı olarak ortaya çıkar; buna bağlı progresif mesane boyutlarında artış (megasistis), mesane duvarında kalınlaşma, ardından fetal hidroüreteronefroz, böbrek parankiminde kompresyon, böbrek displazisi ve amniyon üretiminde azalma (oligohidroamniyoz, anhidroamniyoz) görülmektedir (4). Oligohidroamniyoz, akciğer hipoplazisine yol açmakta bu da fetal ve perinatal mortalite ve postnatal morbiditeye neden olmaktadır (4).

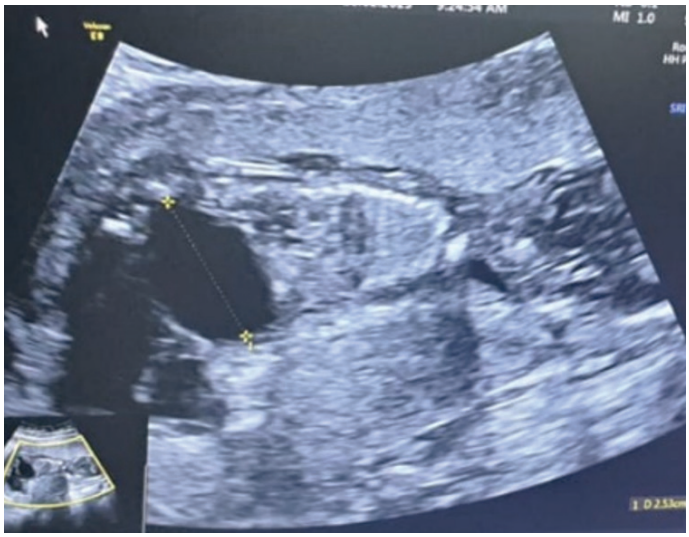
Bu çalışmada bir fetal megasistis olgusunun, ultrasonografik bulgularını, tedavisini ve yönetimini paylaşmak istedik.

2. Olgu sunumu

28 yaşında G1 P0 A0 gebelik öyküsü mevcut olan hasta oligohidroamniyoz ve fetal abdominal kist nedeni ile perinatoloji kliniğine refere edilmiştir. Yapılan ultrason muayenesinde 15 hafta 4 gün ile uyumlu canlı fetüs saptanmıştır. Nazal kemik mevcut, ense kalınlığı 2mm ile uyumluydu. Amniyon mayi azalmış maksimal vertikal cep 20 mm olarak ölçüldü. Sagittal planda mesane boyutları artmış, mesane longitudinal çap 22,7 mm olarak ölçüldü ve megasistis olarak değerlendirildi. Mesanede key hole (anahtar deliği) görüntüsü mevcuttu (Şekil 1). Bilateral böbrekler hiperekojen ve bilateral pelviektazi mevcuttu (Şekil 2). Bütün bu bulgular, LUTO tanısını desteklemektedir. Gebeye ve ailesine LUTO'na eşlik edebilecek genetik hastalıklar ekartasyonu için amniyosentez işlemi önerildi. Megasistisin intrauterin cerrahi tedavisi olan VAS hakkında detaylı bilgi verildi, terminasyon seçeneği konusunda gebe ve yakınları detaylı bilgilendirildi. Gebe ve aile amniosentez işlemi ile fetal intrauterin cerrahi (VAS) yapılmasını istediler. Hasta ve ailenin onamı alındıktan sonra 16. haftada amniyosentez yapıldı. İşlem sonucu normal karyotip olarak raporlandı. Hastanemizde fetal renal fonksiyonları gösteren fetal idrarda, beta 2 mikroglobulin, sodyum ve klor bakılamadığı için vezikosentez (mesane içi idrardan örnek alma) işlemi yapılamadı. Gebelik 17 haftayken ultrason eşliğinde,

Şekil 1. Megasistis ve mesanede key hole görünümü

Şekil 2. Bilateral pelviektazi



Şekil 3. VAS işlemi sonrası şant dislokasyonu nedeniyle gelişen mesanede megasistis görünümü ve anhidroamnios

Şekil 4. Terminasyon sonrası distandü batın görünümü olan fetüs

oligohidroamniyozu olan fetuse amnioinfüzyon (amniyon mayi içerisine serum fizyolojik verilmesi) yapıldı, mesaneye vezikoamniyotik şant (mesane içinden, amniyon mayiye akış sağlayan pigtail kateter) takıldı. İşlem sonrası şant yerinde izlendi. Hasta şifa ile taburcu edildi. Hastaya poliklinik kontrol önerildi. Gebelik 18 hafta 2 gün iken yapılan muayenede fetal kalp atımı mevcut, anhidroamniyoz, mesane longitudinal çap 25 mm, keyhole görünümü tespit edildi (Şekil 3). Şantın obstrükte olabileceği veya şantın yerinden çıkabileceği düşünüldü. Aileye anhidroamniyoz ve fetal kötü prognoz (fetal akciğer hipoplazisi, Prune–belly sendromu, ekstremite fraktürü, basıya bağlı yüzde deformite, renal yetmezlik vs.) hakkında detaylı bilgi verildi. Aileye terminasyon seçeneği tekrar sunuldu, aile gebeliğin termiasyonunu istedi. Onam alındı. Medikal abortu yapıldı. Abort sırasında vezikoamniyotik şantın plasenta ile birlikte geldiğini saptandı. Fetus batını distandü olarak izlendi (Şekil 4). Abort sonrası hasta 24 saat gözleme alındı, şifa ile taburcu edildi.

3. Tartışma

LUTO çeşitli patolojik süreçlerden kaynaklanabilir. En sık gözlenen mekanizmalar arasında posterior üretral valf (PUV), üretral atrezi (UA) ve üretral stenoz yer alır daha az yaygın olarak megasistis-mikrokolon sendromu, megasistis – megaüreter sendromu, tirozomi 21, tirozomi 18 yer alabilmektdir (5). Geniş bir olgu serisinde LUTO' nun altta yatan nedenleri arasında PUV %62, UA %28, üretral stenoz %10 olarak gösterilmiştir (6). Olgumuzda amniosentez sonucu ile genetik hastalıklar ekarte edildiği için megasistis bulgusunun LUTO'ya bağlı olabileceği düşünüldü. Ailenin isteği üzerine abort olan fetüse otopsi yapılamadı. LUTO'nun ultrasondaki karaktersitik bulguları içinde mesane boyutlarında artış (megasistis), mesanede key hole (anahtar deliği) görüntüsü, unilateral veya bilateral hidronefroz, dilate üreter, oligohidroamniyoz veya anhidroamniyoz olabilmektedir (7). Longitudinal mesane çapının 7mm ile 12mm arasında olması sıklıkla geçici bir bulgudur ve fetüslerin yaklaşık %90'ında ikinci trimesterde düzelir (1). Mesane çapının ≥15 mm olması güçlü bir şekilde LUTO'yu düşündürmekte ve gebeliğin diğer trimesterlerinde düzelme şansı yoktur (1). Bizim olgumuzdaki ultrason bulguları literatürü yansıtmaktaydı (Şekil 1-3).

Erken doğum, erken membran rüptürü ve fetal ölüm dahil olmak üzere fetal müdahalenin riskleri göze alındığında, VAS' tan fayda görmesi muhtemel fetüslerin belirlenmesi gereklidir (8-10).

Doğum sonrası sağkalım ve rezidüel böbrek fonksiyonu ile ilişkili olarak doğum öncesi LUTO'nun şiddetini hesaplamak için evreleme sistemleri önerilmiştir. Ruano'nun evreleme sisteminde amniyon mayi, böbrek ekojenitesi, böbrek displazisi ve/veya kortikal kist varlığı, fetal idrar biokimyası gibi çeşitli parametreler kullanılarak derecelendirilir (8). Bu evrelemeye göre evre 1 (hafif dereceli LUTO), 18. gebelik haftasından itibaren normal amniyon mayi, böbreklerde displazi ve kortikal kist olmaması, normal fetal idrar biyokimyası olarak degerlendirilir (8). Oligohidroamniyoz veya anhidroamniyoz varlığı, normal fetal böbrek fonksiyonu varsa, evre 2 (orta dereceli LUTO) olarak, evre 3 ise (şiddetli derecede LUTO) böbrek displazisi ve / veya kortikal kist varlığı, anormal fetal idrar biyokimyası, oligohidroamniyoz veya anhidroamniyoz varlığı şeklinde tanımlanmıştır (8).

Vesikoamniyotik şant, LUTO olan fetüslerde en yaygın kullanılan doğum öncesi müdahaledir (8). Şant amniyotik boşluğa sürekli drenaj sağlayarak obstrükte olan mesanenin boşalmasını sağlamaktadır. Oligohidroamniyoz ve pulmoner hipoplaziyi engellemek için amniyon mayi miktarının artışına olanak sağlar (8). VAS yerleştirilmesinden sonra işleme bağlı komplikasyonlar (şantın yerinden çıkması, şantın tıkanması, fetal asit, erken membran rüptürü, erken doğum, şant bölgesinde herniasyon, fetal ölüm vs.) hastaların %40'ında ortaya çıkabilir (9). Nassr ve ark. VAS yerleştirmenin perinatal sağkalımı hem artırdığını hem de etkilemediğini belirtmişlerdir (10). Ayrıca postnatal iki yıllık takip verilerinin olduğu bazı çalışmalarda VAS'ın doğum sonrası böbrek fonksiyonlarını iyileştirmediği, çocukların %47'sinde

anormal böbrek fonksiyonu olduğu rapor edilmiştir (9,10). VAS yerleştirilmesinin, konservatif yönteme göre daha yüksek bir perinatal sağkalım ile ilişkili olduğu, fakat her iki yöntem arasında anlamlı bir fark olmadığı söylenmektedir (10).

Prenatal megasistis tanısı alan fetüslerin obstrüktif üropatilerin doğum öncesi ve sonrası tedavisinde multidisipliner bir merkezde yüksek riskli gebelik uzmanları tarafından değerlendirilmesi gerekir. Prenatal tedavi endikasyonları ve doğum sonrası perinatal sağkalım için potansiyel faydalar konusunda ebeveynler bilgilendirilmeli, ancak fetal müdahaleye rağmen doğum sonrası böbrek yetmezliği konusunda bilgi verilmelidir. Ultrasonografik teşhis parametrelerinin standardizasyonunu geliştirmek, doğum öncesi biyobelirteçleri doğrulamak ve doğum öncesi bakımı optimize etmek için evreleme sistemlerini geliştirmek ve uzun vadeli sağkalım ve böbrek fonksiyonu açısından fetal müdahaleden en fazla fayda görebilecek hastaların daha doğru seçimini sağlamak için daha fazla çalışmaya ihtiyaç vardır.

Yazar katkısı

Araştırma fikri ve tasarımı: NÇK; veri toplama: NÇK; sonuçların analizi ve yorumlanması: NÇK; araştırma metnini hazırlama: NÇK. Yazar araştırma sonuçlarını gözden geçirdi ve araştırmanın son halini onayladı.

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Author contribution

Study conception and design: NÇK; data collection: NÇK; analysis and interpretation of results: NÇK; draft manuscript preparation: NÇK. The author reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Etlik Zübeyde Hanım Women's Health Training and Research Hospital Ethics Committee (Protocol no. 02/28.02.2024).

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Conflict of interest

The authors declare that there is no conflict of interest.

Kaynaklar

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Case Report

Organ-Preserving Methotrexate Treatment in Recurrent Ectopic Pregnancy: A Case Report

Tekrarlayan Ektopik Gebelik Olgusunda Organ Koruyucu Metotreksat Tedavisi: Vaka Sunumu

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Abstract

Objective: To assess the significance of diagnosis, treatment, and management approaches in cases of recurrent ectopic pregnancies.

Material and Method: This study presents the management of a 31-year-old woman with a history of left tubal pregnancy and subsequent left salpingectomy, who presented with a right tubal ectopic pregnancy. Methotrexate (MTX) treatment was initiated due to the absence of contraindications. On the first day of MTX, the patient's serum βhCG level was 5135.64 U/L, but it continued to rise. Subsequently, the patient received a second dose of MTX. On the fourth day of the second MTX dose, the serum βhCG level was 8333.98 U/L, while on the fifth day of the second MTX dose, the βhCG level dropped dramatically to 6819.35 U/L. Twenty-two days after the second dose of MTX treatment, the serum βhCG level was 848.76 U/L. Transvaginal ultrasound revealed a decrease in the ectopic mass.

Conclusion: Early diagnosis of tubal ectopic pregnancies can be effectively managed through medical intervention, demonstrating a high success rate.

Keywords: ectopic pregnancies; recurrence; medical treatment; success rate

Öz

Amaç: Tekrarlayan ektopik gebelik olgularında tanı, tedavi ve yönetim yaklaşımlarının önemini değerlendirmek.

Gereç ve Yöntem: Bu çalışmada, sol tubal ektopik gebelik ve ardından sol salpenjektomi öyküsü olan ve sağ tubal ektopik gebelik nedeni ile başvuran 31 yaşında bir kadının yönetimi sunulmaktadır. Kontraendikasyon olmaması nedeni ile metotreksat (MTX) tedavisi başlandı. MTX'in ilk gününde hastanın serum βhCG düzeyi 5135,64 U/L idi ancak yükselmeye devam etti. Daha sonra hastaya ikinci doz MTX uygulandı. İkinci MTX dozunun dördüncü gününde serum βhCG düzeyi 8333,98 U/L iken ikinci MTX dozunun beşinci gününde βhCG düzeyi dramatik bir şekilde 6819,35 U/L'ye düştü. İkinci doz MTX tedavisinden 22 gün sonra serum βhCG düzeyi 848.76 U/L idi. Transvajinal ultrasonda ektopik kitlede azalma görüldü.

Sonuç: Tubal ektopik gebeliklerin erken tanısı tıbbi müdahale yoluyla başarılı bir şekilde yönetilebilir ve bu da yüksek başarı oranı gösterir.

Anahtar Kelimeler: tubal ektopik gebelikler; nüks; medikal tedavi; başarı oranı

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1. Introduction

An ectopic pregnancy (EP) is the implantation of a developing embryo/fertilized ovum in a location other than the endometrium in the uterine cavity. The incidence of ectopic pregnancies is reported to be 0.25%-2% (1). Tubal pregnancies are the most common form of EP and have a high maternal mortality and morbidity when they rupture (2). A woman with an ectopic pregnancy may present to hospital with non-specific symptoms such as lower abdominal pain and vaginal bleeding. These symptoms often resemble non-gynecologic conditions such as appendicitis, urinary tract stones or gynecologic conditions such as early pregnancy loss, ovarian torsion or pelvic inflammatory disease (3). In half of the women diagnosed with EP, there are no identified risk factors. However, a history of ectopic pregnancy carries a 10% risk of subsequent pregnancies, and previous tubal pathology/surgery is also considered a risk factor for EP (3,4). To diagnose EP, the patient's medical history is combined with serial βhCG levels, consecutive ultrasound examinations and sometimes uterine aspiration to arrive at a definitive diagnosis of EP (3). Currently, surgical, drug and pregnancy-related treatment options are available to women with EP, with MTX being the mainstay of drug management for EP (5). In this case report, we present our organ-preserving MTX treatment approach in a patient who had previously undergone salpingectomy for a left tubal ectopic pregnancy.

2. Case Report

A 31-year-old female patient (gravida 3, parity 0, abortion 1, ectopic pregnancy 1) was admitted to the early pregnancy service of our hospital with a preliminary diagnosis of ectopic pregnancy after no gestational sac was seen in the uterine cavity during routine pregnancy control. Written and verbal consent was obtained from the patient and her family for this case report. Her medical history revealed a previous single dose of MTX treatment for a left tubal ectopic pregnancy, followed by left salpingectomy. The patient also disclosed a history of allergic asthma. Otherwise, her medical history was unremarkable, and she was a non-smoker. Upon admission, the patient was diagnosed with a pregnancy of 7 weeks and 2 days gestation based on her last menstrual period. She presented in good general condition with stable vital signs and was cooperative during examination. Physical examination revealed no abdominal tenderness or vaginal bleeding. Her serum βhCG level on admission was 5134.64 U/L, with other blood parameters within normal limits. Transvaginal ultrasonography (TVUS) was performed during the night shift and revealed an area consistent with ectopic pregnancy in the right adnexal area of the uterus, along with a ring-of-fire image around the periphery of the uterus measuring 16 mm and a 5.5 cm gestational yolk sac. The patient underwent probe curettage without complications. Radiologic ultrasound imaging was performed the next day after the procedure with a serum βhCG level of 5649.57 U/L. Transabdominal and transvaginal imaging showed an oval formation with thick echogenic walls adjacent to the ovary in the right adnexal lobe with an 8x6 mm cystic area in the center. The patient was administered 100 mg of methotrexate (MTX) intramuscularly. On the 1st day of MTX treatment, serum βhCG level was 5649.57 U/L. On the 4th day after the first dose of MTX, the serum βhCG level was 7744.31 U/L and it was decided to administer the 2nd dose of MTX. On the 4th day after the 2nd dose of MTX, the serum βhCG level was 8333.98 U/L. The patient and her relatives were informed about surgical treatment methods, and it was decided to continue clinical and imaging follow-up along with serum

Table 1. Results of liver function tests measured during the treatment period

	AST (0-32 U/L)	ALT (0-33 U/L)	ALP (35-104 U/L)	LDH (0-247 U/L)	GGT (0-38 U/L)	T.Bilirubin (0.3-1.2 MG/DL)	PT (10-14 S)	INR (0.80-1.2)	aPTT (21.6-32 s)	Fibrinogen (180-400 MG/DL)
Initial admission	33.0	21.0	62.0	157.0	-	-	124	1.06	26	358.01
4th day after the 2nd dose of MTX	77.0	67.0	66.0	208.0	-	-	12.3	1.01	26.3	406.08
5th day after the 2nd dose of MTX	63	58	-	-	14.0	-	11.8	1.01	26.3	406.8
6th day after the 2nd dose of MTX	68	59	58	270	-	0.7	-	-	-	-
7th day after the 2nd dose of MTX	72	64	-	-	-	1.3	-	-	-	-
20th day after the 2nd dose of MTX	29	20	85	157	-	-	11.4	0.97	26.2	350.45

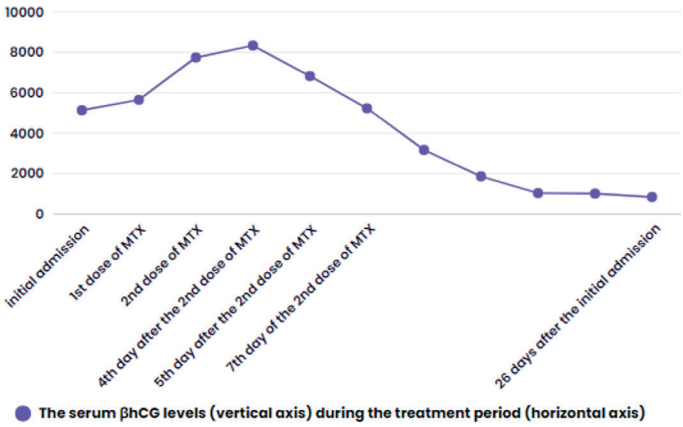

Figure 1. The serum βhCG levels during the treatment period

βhCG level monitoring. On the 5th day after the 2nd dose of MTX, the patient's serum βhCG level decreased dramatically to 6819.35 U/L. The patient with nosebleeds was consulted to internal medicine for evaluation of liver toxicity after MTX treatment and im vitamin K was administered according to the recommendations. Liver function tests showed an increase and the patient was advised by internal medicine to repeat the test and to start ursodeoxycholic acid treatment if the increase continued (Table 1). The next day, nosebleeds recurred and vitamin K treatment was repeated in consultation with internal medicine. On the 7th day of the 2nd dose of MTX treatment, the serum βhCG level measured on the 7th day was 5230.4 U/L and the patient was discharged the next day upon her own request and in accordance with the recommendations of internal medicine. There was no change in the physical examination of the patient during the process, she had vaginal bleeding in the form of spotting from time to time and she reported abdominal pain during defecation twice. After discharge, the patient had groin pain and was admitted to the ward twice as a precautionary measure, but discharge was repeated after a satisfactory decrease in serum βhCG levels (Figure 1). The serum βhCG level measured 26 days after the initial admission was 848.76 U/L.

3. Discussion

Tubal EP is the most common form of EP and clinicians have the important task of diagnosing and treating this condition before the ectopic mass ruptures and threatens the patient's life. EP should be considered in any pregnant woman with vaginal bleeding or lower abdominal pain when an intrauterine pregnancy has not yet been established (3,6). The diagnosis of EP is usually based on ultrasound findings that correlate with serum βhCG levels. Once EP is diagnosed, there are three ways for treating this condition: medication, surgery or expectant management. Intramuscular MTX is the medical treatment for non-ruptured early EPs and can be given in one or multiple doses. Although systemic MTX has more side effects than other treatments, clinicians may prefer MTX in patients who are hemodynamically stable and have no contraindications. Before administering methotrexate, β-hCG levels should be measured on days 1, 4, and 7 of treatment. The first measurement helps the clinician decide between the one- and two-dose protocols (3). MTX success is defined as a greater than 15% decrease in βhCG levels between four and seven days after treatment with MTX (7).

A study by Lipscomb et al. reported that previous EP was associated with success of systemic MTX treatment, but the previous treatment modality (salpingostomy, salpingectomy or previous systemic MTX) was not conclusively associated with treatment failure (6).

A retrospective cohort study by Khalil et al. reported that a single dose of MTX was sufficient to terminate EP in 55.9% of patients and that EP was successfully treated in 93.8% of patients after the second dose of MTX (7).

A study by Karadeniz et al. reported that for the tubal EP cases βhCG level on admission and diameter of EP mass can predict tubal rupture (8). Another case report reported a successfull multiple dose MTX treatment on unilateral twin tubal ectopic pregnancy (9). Additionally, these two studies provide examples of our hospital's EP treatment approaches.

In this case, the patient was an ideal candidate for systemic MTX treatment as there was no contraindication and serum βhCG levels were high. One of the main reasons of choosing medical treatment in this case was patient's history of salpingectomy and her desire to become pregnant. Although serum βhCG levels were elevated until the fifth day of the second MTX dose, the success of organ-sparing MTX treatment cannot be overlooked.

In our case report, we present our approach to organ-sparing MTX therapy in a patient who had previously undergone a left salpingectomy for an ectopic pregnancy and whose serum βhCG levels continued to rise until the fifth day of the second MTX dose. The patient and clinicians had a very harmonious and good relationship during the treatment process. The patient was informed of every step and decision regarding her treatment and was aware of all side effects. During treatment, she had epistaxis twice and abdominal pain during bowel movements twice. After the second dose of MTX, her liver enzymes were elevated for a while, but after a few days the tests were normal.

Improving the standardization of ultrasound diagnostic parameters, the validation of biomarkers and the correct choice of treatment are very important in this patient group. It is clear that further studies are needed in this area.

Author contribution

Study conception and design: RSK; data collection: RSK and ZNE; analysis and interpretation of results: RSK and ZNE; draft manuscript preparation: RSK and ZNE. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

Written and verbal consent was obtained from the patient and her family for this case report.

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Conflict of interest

The authors declare that there is no conflict of interest.

Yazar katkısı

Araştırma fikri ve tasarımı: RSK; veri toplama: RSK ve ZNE; sonuçların analizi ve yorumlanması: RSK ve ZNE; araştırma metnini hazırlama: RSK ve ZNE. Tüm yazarlar araştırma sonuçlarını gözden geçirdi ve araştırmanın son halini onayladı.

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