



Primary Cesarean Section Rates in Late Term and Term Pregnancies: A Retrospective Study

Uzamış ve Term Gebeliklerde Primer Sezaryen Oranları: Bir Retrospektif Çalışma

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ABSTRACT

Objective: To evaluate the effects of maternal-fetal factors on the mode of delivery in late term pregnancies (≥ 41 and < 42 weeks of gestation) with spontaneous onset of labor.

Material and Methods: Patients who underwent vaginal delivery and primary cesarean section between 2017 and 2019 at our institution were divided into 2 groups, namely, term (≥ 37 and < 41 weeks of gestation) and late term pregnancies. The groups were compared in terms of maternal age, mode of delivery, fetal gender, birth weight, and primary cesarean indications.

Results: Of the 1,298 cases included in the study, 124 (9.6%) were late term pregnancies and 1,174 (90.4%) were term pregnancies. Fetal weight was found to be significantly higher in late term pregnancies (3510.3 ± 358.9 g) than in term pregnancies (3310.4 ± 445.0 g) ($p < 0.001$). However, there was no significant difference in primary cesarean rates between late term pregnancies (22.6%, 28/124) and term pregnancies (17.0%, 200/1174) ($p > 0.05$).

Conclusion: No difference was found between late term pregnancies and term pregnancies with spontaneous labor in terms of primary cesarean rates and indications. Therefore, waiting for spontaneous labor may be an appropriate option in the management of late pregnancies.

Key Words: Cesarean section, Late term pregnancy, Birth weight

ÖZ

Amaç: Doğumu spontan başlayan geç dönem gebeliklerdeki (≥ 41 ve < 42 . gebelik haftası) maternal-fetal faktörlerin, doğum şekli üzerine etkilerini değerlendirmek.

Gereç ve Yöntemler: Kurumumuzda 2017 ve 2019 yılları arasında vajinal doğum ve primer sezaryen yapılan hastalar, term (≥ 37 ve < 41 . gebelik haftaları) ve geç dönem gebelikler olarak iki gruba ayrıldı. Gruplar anne yaşı, doğum şekli, fetal cinsiyet, doğum ağırlığı ve primer sezaryen endikasyonları açısından karşılaştırıldı.

Bulgular: Çalışmaya dahil edilen 1298 olgunun 124'ü (%9,6) geç dönem gebelik, 1174'ü (%90,4) term gebelik idi. Fetal ağırlık geç dönem gebeliklerde ($3510,3 \pm 358,9$ g) term gebeliklere göre ($3310,4 \pm 445,0$ g) anlamlı olarak daha yüksek bulundu ($p < 0,001$). Ancak, geç dönem gebelikler (%22,6; 28/124) ile term gebelikler (%17,0; 200/1174) arasında primer sezaryen oranları açısından anlamlı fark yoktu ($p > 0,05$).

Sonuç: Primer sezaryen oranları ve endikasyonları açısından doğumu spontan başlayan geç dönem ve term gebelikler arasında fark bulunmadı. Bu nedenle, geç dönem gebeliklerin yönetiminde spontan doğum başlangıcını beklemenin uygun bir seçenek olabileceğini düşünüyoruz.

Anahtar Sözcükler: Sezaryen, Uzamış gebelik, Doğum ağırlığı

INTRODUCTION

Term pregnancy refers to a pregnancy between 37 and 41 weeks from the first day of the last menstrual period. Post-term pregnancy is defined by the World Health Organization (WHO) as a pregnancy that lasts for more than 42 weeks from the last menstrual period (1). Late term pregnancy refers to a pregnancy without onset of labor between 41^{+0} (41 weeks, 0 days) and 41^{+6} (41 weeks, 6 days) weeks from the last menstrual date. The etiologies of post-term and late term pregnancies are largely unknown; however, primiparity, advanced maternal age, maternal obesity, previous post-term pregnancy, and male fetus are considered as risk factors (2-5).

Fetal complications such as meconium aspiration syndrome, asphyxia, sepsis, shoulder dystocia, and maternal complications such as puerperal infections, postpartum hemorrhage, emergency cesarean sections, and cervical lacerations are more common in late term pregnancies than in term births (2,3). Induction of labor is recommended for post-term pregnancies (3); however, there is no established management protocol for late term pregnancies, which account for 15%-20% of all pregnancies (2,6). There are two types of managements that are labor induction and expectancy. Half of the pregnant women with late term pregnancies can go into spontaneous labor between 41^{+0} and 41^{+3} weeks of gestation (7). Additionally, labor induction increases primary cesarean rates (8,9).

In this study, we aimed to compare late term pregnancies and term pregnancies with spontaneous onset of labor in

terms of primary cesarean rates and evaluate the effects of expectant management on the mode of delivery in late term pregnancies.

MATERIAL and METHODS

This retrospective study included pregnant women who delivered between 2017 and 2019 at a tertiary health care institution. The study was approved by the local ethics committee (#211-2019). Due to the retrospective design of the study and anonymized data used in the analyses, informed consent was not obtained from the patients.

The data of the patients were obtained from the patient files. Demographic data, number of pregnancies and births, modes of delivery (vaginal delivery or primary cesarean section), and genders and weights of the newborns were recorded. The cases were divided into 2 groups: term pregnancies (37^{+0} - 40^{+6} weeks) and late term pregnancies (41^{+0} - 41^{+6} weeks). The groups were compared in terms of maternal age, mode of delivery, fetal gender, birth weight, and primary cesarean indications. The study included pregnant women over the age of 19 years with singleton pregnancies who underwent at least two antenatal follow-ups and delivered via vaginal or primary cesarean mode at our institution. Pregnant women in the adolescence age group [defined by the WHO as individuals in the 10-to-19-year age group (10)] and those with a history of induction of labor, labor due to previous cesarean section, multiple pregnancies, breech and transverse presentations, and known chronic vascular, endocrine, or autoimmune disease were excluded from the study (Figure 1).

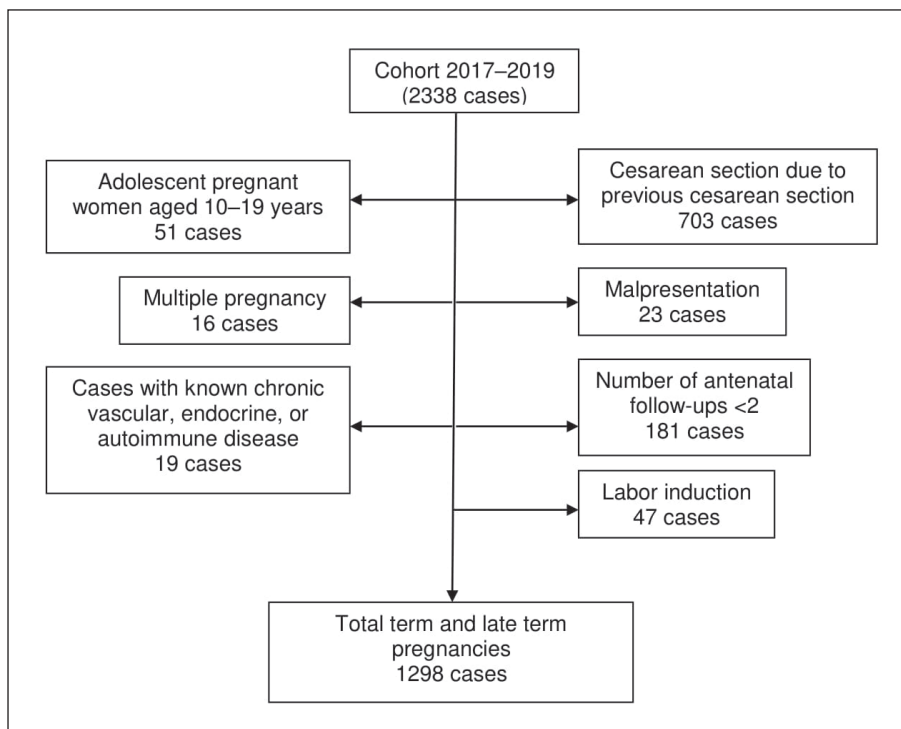


Figure 1: Flow chart of exclusion criteria.

Data regarding the gestational age of the patients, last menstrual date, and fetal crown-rump length on first trimester ultrasonography (USG) were evaluated and calculated together. Gestational age was determined based on the date of the last menstrual period, if the last menstrual date was accurate, and consistent with the first-trimester obstetric USG data; otherwise, it was determined based on the fetal crown-rump length data of the first-trimester obstetric USG (11).

The age of the patients was expressed as mean±standard deviation (SD). Categorical data were compared using the chi-square and Fisher's exact tests. For the comparison of non-categorical data, Student's *t*-test was used if data were normally distributed and the Mann-Whitney U test was used for data with skewed distributions. Statistical analysis was performed using SPSS version 20.0 software (IBM Corporation, Armonk, NY, USA), and a *p*-value <0.05 was considered statistically significant.

RESULTS

The study included a total of 1298 cases of vaginal and primary cesarean deliveries that met the inclusion criteria. Of these, 124 (9.6%) were late term pregnancies and 1174

(90.4%) were term pregnancies. The overall mean age was 26.7±5.9 (range: 19-45) years, and the mean birth weight was 3329.5±441.3 g (range: 1560-4900).

When the two groups were compared in terms of birth weight, late term pregnancies had significantly higher birth weight (*p*<0.05). Additionally, male fetuses were more common in late term pregnancies than in term pregnancies (*p*<0.05). The comparative data of the study population are summarized in Table I.

Overall, 1070 (82.4%) were cases of vaginal delivery and 228 (17.6%) of cesarean section. When the two groups were compared in terms of primary cesarean indications, no significant difference was observed (*p*>0.05). Prolonged labor was the most common primary cesarean indication in both term pregnancies and late term pregnancies (41.5% and 57.1%, respectively). The distribution of term and late term pregnancy cases according to cesarean section indications are summarized in Table II.

When term and late term pregnancies were compared in terms of the effect of fetal gender on the mode of delivery, no significant relationship was identified (*p*>0.05). In our study, a significant relationship was observed between

Table I: Comparative data between the groups.

Parameter	Term pregnancies (37-41 weeks)	Late term pregnancies (> 41 weeks)	P-value
Vaginal delivery n (%)	974 (83.0)	96 (77.4)	0.123*
Primary cesarean section n (%)	200 (17.0)	28 (22.6)	
Female fetus n (%)	554 (47.2)	53 (42.7)	0.033*
Male fetus n (%)	620 (52.8)	71 (57.3)	
Age of the patient, years	26.8±6.0	26.2±5.2	0.561 [†]
Birth weight, g	3310.4±445.0	3510.3±358.9	<0.001

Data are presented as n (%) or mean±standard deviation.

*Pearson's chi-squared test, [†] Mann-Whitney U Test.

Table II: Distribution of cases according to cesarean section indications.

Caesarean section indication	Term pregnancies (37-41 weeks) n (%)	Late term pregnancies (> 41 weeks) n (%)	P-value	Total n (%)
Prolonged labor	83 (41.5)	16 (57.1)	0.199*	99 (50.0)
Placental pathologies	13 (6.5)	0 (0)		13 (6.6)
Fetal macrosomia	24 (12.0)	3 (10.7)		27 (13.6)
Intrapartum fetal distress	50 (25.0)	7 (25.0)		57 (28.8)
Complicated hypertensive disease of pregnancy	30 (15.0)	2 (7.2)		2 (1.0)

Data are presented as n (%).

*Pearson's chi-squared test.

birth weight and the mode of delivery in term pregnancies ($p < 0.001$) but not in late term pregnancies ($p = 0.781$). The distribution of cases according to fetal gender and birth weight are summarized in Tables III and IV. Perinatal death was seen in only five cases (0.43%), all of which were in the term pregnancy group.

DISCUSSION

Previously, late term pregnancies and term pregnancies have not been compared in terms of primary cesarean indications. In the present study, non-progressive labor and intrapartum fetal distress were the primary indications for cesarean section in both term and late term pregnancies. The most striking finding in our study was that although fetal weight was significantly higher in late term pregnancies, there was no significant difference between term pregnancies and late term pregnancies in terms of primary cesarean section rates. In our institution, we do not perform labor induction for late term pregnancies except in cases of pre-eclampsia, prenatal membrane rupture, and other maternal-fetal indications. In our study that excluded cases of labor induction, the primary cesarean rate was 17.6%. In a multi-center study, Hutcheon et al. evaluated pregnancy outcomes in 14,627 late term pregnancies and reported that the primary cesarean section rate was 28% in institutions where the labor induction rate was less than 20%. No significant difference was found between the groups when this ratio was compared with primary

cesarean rates in term pregnancies (12). In the same study, it was reported that approximately 90% of cases delivered spontaneously before 42 weeks of gestation; therefore, the authors concluded that there was no evidence that routine labor induction affects maternal and neonatal health outcomes in late term pregnancies (12).

Walsh et al. evaluated the effects of birth weight on the mode of delivery in their study that included 7,528 nulliparous women at ≥ 37 weeks of gestation; they reported that the rate of primary cesarean section was significantly lower in the group with spontaneous labor than in the group with induced labor, with a significant increase in the primary cesarean rate for every 500g increase in birth weight (13). In a study of nulliparous pregnant women, Smith et al. evaluated the effects of late term pregnancy on primary cesarean rates and reported a significant relationship between fetal weight percentile and primary cesarean section rates (14). Since all late term pregnancies in our study underwent spontaneous labor and there was no limitation of gravidity in our inclusion criteria, we believe that the significant difference between the 2 groups in terms of birth weight was not reflected in primary cesarean rates. However, intragroup comparisons revealed that there was a significant relationship between fetal weight and primary cesarean section rates in term pregnancies as opposed to late term pregnancies, which was an interesting finding.

Table III: The mode of delivery according to fetal gender.

Mode of delivery	Total cases n (%)		P value*	Term births n (%)		P value*	Late term pregnancies n (%)		P value*
	Female	Male		Female	Male		Female	Male	
Vaginal	525 (84.0)	545 (81.0)	0.153	467 (47.9)	507 (52.1)	0.251	58 (60.4)	38 (39.6)	0.188
Primary cesarean	100 (16.0)	128 (19.0)		87 (43.5)	113 (56.5)		13 (46.4)	15 (53.6)	

Data are presented as n (%).

*Pearson's chi-squared test.

Table IV: Birth weight according to the mode of delivery.

Mode of delivery	Weight in overall cases (g)	P value*	Weight in term pregnancies (g)	P value*	Weight in long term pregnancies (g)	P value*
Vaginal	3303.32±411.82	<0.001	3283.8±411.5	<0.001	3501.0±361.1	0.781
Primary cesarean	3452.4±543.8		3439.9±564.6		3542.1±356.0	

Data are presented as mean±standard deviation.

*Mann-Whitney U test

Kortekaas et al. evaluated 479,097 cases and reported perinatal mortality rates of 0.15% in late term pregnancies and 0.21% in term pregnancies (15). In the same study, the main cause of perinatal deaths was intrapartum fetal asphyxia, particularly in the late term pregnancy group. In their meta-analysis with 14 randomized controlled trials, Hussain et al. found that the choice of labor induction was less associated with perinatal death when compared with monitoring in the management of late term pregnancies, while labor induction did not result in a significant difference in the stillbirth rate (16). However, Hutcheon et al. concluded in their multicenter retrospective study that labor induction in late term pregnancies had neither adverse maternal nor fetal outcomes, and all late term pregnancies underwent spontaneous labor without any incidence of perinatal death (12).

Multiple studies have previously reported a significant relationship between advanced maternal age and increased primary cesarean rates (14,17,18). In accordance with the same, we found that the mean age was significantly higher in our cases who underwent primary cesarean section than those who underwent vaginal delivery; however, no significant relationship was found between maternal age and late term pregnancies. On reviewing the literature, we did not find any study that investigated the relationship between maternal age and late term pregnancy.

In two studies [one that included pregnant women at 37–43 weeks of gestation (14) and the other that included post-term pregnant women at ≥ 42 weeks of gestation (19), primary

cesarean rates were reported to be significantly higher in pregnancies with male fetuses. In the present study, late term pregnancy was found to be significantly higher in pregnant women with male fetuses. However, contrary to those 2 studies, there was no significant relationship between the mode of delivery and fetal gender in either the term pregnancy or late term pregnancy group.

The strength of our study is that all pregnant women included in the study underwent spontaneous labor because labor induction is not used in late term pregnancies admitted to our clinic, except for indications of termination of pregnancy. The limitations of our study are that it had a retrospective single-center design and a smaller number of patients than many other studies. However, as we did not include pregnant women who underwent induction of labor, we believe that this helped eliminate labor induction as a confounding factor in assessing the primary cesarean rates. In the future, randomized controlled trials at multiple centers with a uniform management protocol of late term pregnancies are warranted to corroborate our findings.

CONCLUSION

No difference was found between late term pregnancies and term pregnancies with spontaneous labor in terms of primary cesarean rates and indications. Maternal age and fetal gender and birth weight did not have a significant correlation with the higher primary cesarean rates in late term pregnancies. Therefore, expectant management may be an appropriate option in late term pregnancies.

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