Experimental
&
Clinical Article

Maternal and Perinatal Outcomes of Pregnancies with Uterine Leiomyomas

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ABSTRACT

OBJECTIVE: We aimed to determine the effect of uterine leiomyoma characteristics and cesarean myomectomy on maternal and perinatal outcomes.

STUDY DESIGN: The study included patients with singleton pregnancies and uterine leiomyomas who had delivered at or beyond 24 weeks' gestation; without comorbidities, uterine anomalies, or fetal malformations. Data from 240 patients were studied between 2012 and 2022 in the perinatology clinic of a tertiary care center. Maternal and perinatal outcomes were obtained from medical records.

RESULTS: Among the women with uterine leiomyomas, 21.7% were delivered vaginally and 78.3% via cesarean section. Myomectomy was performed in 150 out of 188 (79.8%) patients undergoing cesarean section. It was found that cases with leiomyomas ≥7 cm, compared to those with <4cm, had deliveries at earlier gestational weeks (36w6/7±2d vs. 37w+6/7±2d, p=0.018) and had lower newborn birthweight (2849.44±516.74 g vs. 3237.5±350.6 g, p<0.001), longer operation time (105.92±34.78 min vs. 68.21± 22.31 min, p<0.001) and a higher rate of neonatal intensive care unit requirement (48.1% vs. 13.7%, p<0.001). In cases with ≥2 leiomyomas compared to those with single leiomyomas, gestational age at birth was smaller and birthweight was lower (p<0.05). The amount of blood loss (969.66±427.21 mL vs. 738.15±337.2 mL and 553.84±366.46 mL), duration of surgery (83.23±29.56 min vs. 64.47±17.96 min) and transfusion requirements (36% vs. 5.3% and 28.8%) were higher in women who underwent myomectomy during cesarean section than in the other women undergoing only cesarean section or delivering vaginally (p<0.05).

CONCLUSION: It was found that a leiomyoma size of ≥7 cm and number of ≥2 were both associated with earlier gestational age at birth and lower birth weight. Myomectomy performed during cesarean section increased the blood loss, duration of surgery, and the need for transfusion.

Keywords: Leiomyomas, Maternal outcome, Myomectomy, Pregnancy, Perinatal outcome

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Introduction

Leiomyomas are the most common benign gynecologic tumors and develop in 20-40% of women during the reproductive period (1). Uterine leiomyoma is observed more frequently during pregnancy due to the pregnancy planning of women at older ages and the increase in cesarean section rates in recent years (2). In previous epidemiological studies, the incidence of leiomyomas in pregnant women ranged from 0.1-3.9%. It can be difficult to detect leiomyomas during pregnancy because it is difficult to distinguish them from the physiologic thickening of the myometrium at the ultrasonographic examination (3). Although leiomyomas are usually asymptomatic during pregnancy; depending on the size, location, and type (intramural, subserous, submucosal), complications such as spontaneous abortion, preterm labor (PL), preterm premature rupture of membranes (PPROM), placental abruption, fetal presentation anomaly, atony, and postpartum hemorrhage can be observed (3,4). Although it is not clear how leiomyomas cause obstetric complications; hypotheses such

as uterine tension, obstruction, effects on contraction pattern, alteration of endometrial structure, inflammation, and molecular signaling have been proposed (3,5).

There are conflicting results in the literature regarding the effects of myomectomy during the cesarean section on obstetric outcomes. Some authors argue that myomectomy during cesarean section should be avoided because of uterine atony, risk of hysterectomy, and fertility-reducing effects (6,7). Some authors are striving to change this view and recommend myomectomy during cesarean section in selected groups of patients due to the reduction of the need for repeat surgery, risks, and overall costs (8).

Considering these conflicts in the literature, we aimed to determine the effects of uterine leiomyoma and cesarean myomectomy on maternal and perinatal outcomes.

Material and Method

This retrospective cohort study evaluated the medical records of pregnant women with uterine leiomyomas at a tertiary care center between 2012 and 2022. The study protocol was approved by the institutional review board (Approval number: 07.09.2022 2022/126). Signed informed consent was obtained from all women who participated in the study on admission to the hospital for delivery so that their medical records could be used for future studies.

Women with singleton pregnancies who had known leiomyomas before pregnancy or leiomyomas detected during pregnancy and who had delivered at or beyond 24 weeks of gestation, were included in the study.

Women with uterine abnormalities, fetal malformations, and systemic diseases, who delivered in another center and with incomplete data were excluded from the study. Maternal age, gravidity, parity, body mass index (BMI), gestational age at delivery, leiomyoma number and location, leiomyoma degeneration, increase in leiomyoma size during pregnancy, mode of delivery, obstetric complications including PL, PPROM, intrauterine growth restriction (IUGR), malpresentation, placenta previa, abruptio placentae, uterine atony; need for transfusion, operation time, length of hospital stay; postoperative complications including rest placenta, wound infection, and endometritis was reviewed from medical records. Perinatal outcomes including birthweight, APGAR score at the first and fifth minutes, and need for neonatal intensive care unit (NICU) were also assessed. Women were grouped according to the leiomyoma number (1 and ≥2), the leiomyoma size (<4 cm, 4-6 cm, and ≥7 cm), the leiomyoma location (corporal and cervical), and the leiomyoma type (intramural, subserosal, and combined). It was investigated whether there was a significant difference in maternal and perinatal outcomes among these groups. In addition, the study population was divided into three groups according to the type of delivery (vaginal delivery [Group 1], cesarean section [Group 2], and myomectomy during cesarean section [Group 3]). Maternal and perinatal outcomes of these 3 groups were also compared.

Statistical Analysis

IBM SPSS The Statistics 26.0 program (SPSS Inc, Chicago, IL, USA) was used for statistical analysis of the data obtained. The normal distribution of the variables was determined graphically and with the values of Skewness-Kurtosis.

Normally distributed variables were presented as mean ± standard deviation; those not distributed normally were presented as median (minimum-maximum) and categorical variables were presented as number (n) and percentage. Pearson's chi-square test and Fisher's exact test were used to examining the differences between the categorical variables. Independent sample T-test was used to examine the differences in the values of the gestational week at birth, newborn birthweight, operation time, amount of blood loss, and length of hospital stay. One Way ANOVA test was used to determine the difference among groups determined according to the leiomyoma size and the leiomyoma type. Bonferroni and Tukey corrections were used to determine which group caused the difference. The results of the Pearson chi-square test were used to analyze the distribution of categorical variables in the groups. In cases where the number of subjects was insufficient, the exact test result was reported. If a significant difference was found, two independent ratio tests were used to examine the group that caused the difference. Data were analyzed within the 95% confidence interval, and $p<0.05$ was taken as the statistical significance level.

Results

A total of 240 pregnant women were included in the study. The clinical characteristics and maternal and perinatal outcomes of the study population are shown in table I. The mean age of the pregnant women was 33.5±4.7 years and the mean BMI was 30.4±4.56 kg/m^2. The mean gestational age at delivery was 37w5/7±2d, and the mean birthweight was 3170.37±416.072 g. One hundred and eighty-eight women (78.3%) had delivered by cesarean section (C/S) and the rest 52 (21.7%) had delivered vaginally. Myomectomy was performed in 150 out of 188 women undergoing C/S (79.8%). The number of pregnant women with two or more leiomyomas in the study population was 52 (21.7%). According to leiomyoma size, there were 146 (60.8%), 67 (27.8%), and 27 (11.4%) pregnant women with leiomyoma sizes of < 4 cm, 4-6 cm, and ≥7 cm, respectively. Twenty-five (75.7%) out of 33 women with PL, 29 (87.8%) out of 33 women with PPROM, 12 (100%) of 12 women with placenta previa, 10 (66.6%) out of 15 women with IUGR, 12 (75%) out of 16 women with presentation anomalies, and 6 (75%) out of 8 women with ablatio placentae were delivered by C/S. All nine women with uterine atony had been delivered by C/S and 8 (88.8%) cesarean myomectomies have been performed (Table II).

Table I: *Clinical characteristics and outcomes of pregnant women with uterine leiomyomas*

	Mean ± SD	Median (min-max)
Age (y)	33.5±4.7	34 (24-43)
BMI (kg/m^2)	30.4±4.56	30.84 (20.55-42.67)
Gravida	3.4±1.8	3 (1-8)
Parity	2.1±1.4	1 (0-6)
Gestational age (week + day)	37w+5d±2d	38 (26-40)
Birthweight (g)	3170.37±416.072	3200 (1200-4150)
Operation time (min)	76.75±27.18	70 (40-180)
Blood loss (mL)	832.91±438.81	900 (100-2300)
Hospital stay (day)	2.44±0.68	2 (2-6)

BMI: Body mass index, SD: Standard deviation

Table II: *Clinical characteristics of leiomyoma and maternal and perinatal outcomes*

	n (%)
Type of leiomyoma	
Submucosal	0 (0)
Intramural	35 (15)
Subserosal	72 (30)
Combined	133 (55)
Number of leiomyomas	
1	188 (78.3)
≥2	52 (21.7)
Size of leiomyoma	
< 4 cm	146 (60.8)
4-6 cm	67 (27.8)
≥7 cm	27 (11.4)
Site of leiomyomas	
Corporal	227 (94.6)
Cervical	13 (5.4)
Type of delivery	
Vaginal	52 (21.7)
Cesarean section	188 (78.3)
Obstetric complications	
No complication	114 (47.5)
Preterm labor	33 (13.8)
PPROM	33 (13.8)
Placenta previa	12 (5)
IUGR	15 (6.3)
Malpresentation	16 (6.6)
Uterine atony	9 (3.7)
Placental abruption	8 (3.3)
Postoperative complications	
No complication	163 (67.9)
Rest placenta	26 (10.8)
Surgical site infection	20 (8.3)
Endometritis	16 (6.7)
Bleeding	15 (6.3)
Transfusion need	
Yes	71 (29.6)
No	169 (70.4)
APGAR score in 1st minute	
<7	19 (7.9)
≥7	221 (92.1)
APGAR score in 5th minute	
<7	0
≥7	240 (100)
NICU requirement	
Yes	50 (21)
No	190 (79)

PPROM: Preterm premature rupture of membranes, IUGR: intrauterine growth restriction, NICU: Neonatal intensive care unit

Regarding the association between leiomyoma characteristics and maternal and perinatal outcomes (Table III), gestational age at birth (36h+6/7±2g vs. 37h+6/7±2g, p=0.018) and birthweight (2849.44±516.74 g vs. 3237.5±350.6 g, p<0.001) were lower in women with the leiomyoma size of ≥7 cm compared to <4 cm, whereas the operative time was longer (105.92±34.78 min vs. 68.21±22.31 min, p<0.001). The blood transfusion rate (27.4% vs. 44.4%, p=0.197) and the need for NICU (13.7% vs. 48.1%, p<0.001) were found to be higher in patients with a leiomyoma size of ≥7 cm, the rate of need for NICU was statistically significant. The gestational age at birth (36w6/7±2d vs. 37w6/7±1d, p=0.015) and birthweight (2919.23±464.75 g vs. 3239.84±374.10 g, p<0.001) were significantly lower in pregnant women with ≥2 leiomyomas. The obstetric complications including PL (11.2% vs. 23.1%), PPROM (12.2% vs 19.2%), IUGR (5.3% vs. 9.6%), uterine atony (2.7% vs. 7.7%) were more frequent in women with ≥2 leiomyomas (p<0.001). Table IV shows the rate of obstetric complications according to the size and number of the leiomyoma.

There was no difference between the groups determined according to the leiomyoma location and type, with respect to the gestational age at delivery, birthweight, operation time, and length of hospital stay (p>0.05), but the estimated blood

Table III: *Obstetric outcomes according to the characteristics of leiomyomas*

	Gestational age at delivery (week ± day)	Birthweight (g)	Operation time (min)	Blood loss (mL)	Length of hospital stay (day)
Size of leiomyoma					
<4cm (n=146)[a]	37w+6d±2d[a]	3237.5±350.6[a]	68.21±22.31[a]	833.21±432.72	2.45±0.72
4-6 cm (n=67)[b]	37w+2d±2d	3153.43±446.3	83.58±23.41	849.25±482.53	2.46±0.58
≥7 cm (n=27)[c]	36w+6d±2d[c]	2849.44±516.74[c]	105.92±34.78[c]	790.74±363.75	2.33±0.67
p	**0.018**	**<0.001**	**<0.001**	0.884	0.679
Number of leiomyomas					
1 (n=188)	37w+6d±1d	3239.84±374.10	76.56±27.04	830.85±440.68	2.42±0.68
≥2 (n=52)	36w+6d±2d	2919.23±464.75	77.4±27.92	840.38±436.23	2.5±0.67
p	**0.015**	**<0.001**	0.845	0.890	0.487
Site of leiomyoma					
Corporal (n=227)	37w+3d±2d	3179.38±400.84	76.76±27.01	833.62±438.27	2.43±0.69
Cervical (n=13)	37w±2d	3028.46±639.42	76.92±32.05	861.53±457.41	2.53±0.51
p	0.281	0.205	0.987	0.824	0.607
Type of leiomyoma					
Intramurala (n=35)	37w+3d±2d	3241.57±437.57	79.28±31.74	908.57±450.73[a]	2.45±0.7
Subserosal (n=72)[b]	37w+3d±2d	3181.04±362.13	77.98±27.97	720.13±431.72[b]	2.56±0.88
Combined (n=133)[c]	37w+3d	3145.86±437.69	75.41±25.54	874.06±431.19	2.36±0.52
p	0.991	0.466	0.680	**0.030**	0.130

a,b,c: groups with different letters are significantly different from each other. Bonferroni and Tukey were used as posthoc tests to show differences among groups

Table IV: *Comparison of obstetrics complications according to the size and number of leiomyomas*

	Size of leiomyoma				Number of leiomyomas		
	<4 cm (n=146)	4-6cm (n=67)	≥7 cm (n=27)	*p*	1 (n=188)	≥2 (n=52)	*p*
Obstetrics complications				0.670			0.01
No complication	67 (45.9)	29 (43.3)	12 (44.4)		98 (52.1)	12 (23.1)	
Preterm labor	21 (14.4)	8 (11.9)	6 (22.2)		21 (11.2)	12 (23.1)	
PPROM	19 (13)	12 (17.9)	2 (7.4)		23 (12.2)	10 (19.2)	
Placenta previa	9 (6.2)	5 (7.5)	2 (7.4)		11 (5.9)	5 (9.6)	
IUGR	10 (6.8)	4 (6)	4 (6)		10 (5.3)	5 (9.6)	
Malpresentation	11 (7.5)	11 (7.5)	3 (11.1)		13 (6.9)	3 (5.8)	
Uterine atony	6 (4.1)	2 (3)	1 (3.7)		5 (2.7)	4 (7.7)	
Placental abruption	0 (0)	5 (7.5)	3 (2.1)		7 (3.7)	1 (1.9)	

PPROM: Preterm premature rupture of membranes, IUGR: intrauterine growth restriction

loss was higher in women with intramural leiomyomas than in those with subserosal leiomyomas (908.57±450.73 mL vs. 720.13±431.72 ml, p=0.03) (Table III). Regarding obstetric complications, all 15 patients with IUGR, 9 with uterine atony, and 8 with placental abruption belonged to the group with corporal leiomyomas.

When comparing the groups determined according to the type of delivery, birthweight was significantly different between Group 1 (3106.53±617.31 g) and Group 2 (3349.21± 378.67 g), and Group 2 and Group 3 (3147.2±405.12 g) (p=0.012) (Table V). The operation time was longer in the group of women who had undergone cesarean myomectomy (83.23±29.56 min) than in the group who had undergone cesarean section (64.47±17.96 min) (p<0.001). When the estimated blood loss was compared among the three groups, it was found to be significantly different in all groups and higher in Group 3 (p<0.001). Among the patients requiring transfusion (n=71), 54 (76.1%) were in Group 3, 15 (21.1%) in Group 1, and 2 (2.8%) in Group 2; and the difference between the groups was statistically significant (p=0.001). The incidence of postoperative complications was higher in Group 3, compared to the other groups (p=0.037). The most common complication was placental rest in 20 (13.3%) women. There was no difference between the groups regarding obstetric complications. No significant association was found between the leiomyoma size, number, location, type, and mode of delivery (p>0.05).

Discussion

The results of the study showed that a leiomyoma size of ≥7 cm and the presence of more than one leiomyoma were associated with earlier gestational age at delivery and lower birth weight. In addition, leiomyomas ≥7 cm were associated with a longer operation time and a higher rate of NICU admission. Performing myomectomy during a cesarean section was found to increase the duration of the operation, blood loss during the operation, and the need for transfusion. Although uterine leiomyoma is a benign condition, it can lead to com-

Table V: *Obstetric outcomes according to the delivery route*

	Vaginal birth (n=52)[a]	C-section (n=38)[b]	C-section+ myomectomy (n=150)[c]	*p*
Gestational age (w)	37w3/7±2d	37w4/7±2d	37w3/7±2d	0.756
Leiomyoma size	n (%)	n (%)	n (%)	0.269
< 4cm (n=146)	36 (69.2)	23 (60.5)	87 (58)	
4-6 cm (n=67)	9 (17.3)	13 (34.2)	45 (30)	
≥ 7 cm (n=27)	7 (13.5)	2 (5.3)	18 (12)	
Number of leiomyomas				0.658
1	43 (82.7)	30 (78.9)	115 (76.7)	
≥2	9 (17.3)	8 (21.1)	35 (23.3)	
Type of leiomyoma				0.271
Intramural (n=35)	5 (9.6)	24 (16)	6 (15.8)	
Subserosal (n=72)	11 (21.2)	49 (32.7)	12 (31.6)	
Combined (n=133)	36 (69.2)	77 (51.3)	20 (52.6)	
Operation time (min)	-	64.47±17.96	83.23±29.56	**<0.001**
Blood loss (ml)	553.84±366.46[a]	738.15±337.2[b]	969.66±427.21[c]	**<0.001**
Transfusion need				**0.001**
Yes	15 (28.8)[a]	2 (5.3)[b]	54 (36)[c]	
No	37 (71.2)	36 (94.7)	96 (64)	
Length of hospital stay (d)	2.42±0.6[a]	2.28±0.45[b]	2.48±0.74[c]	**0.044**
Postoperative complications				**0.037**
No complication	44 (84.6)[a]	31 (81.6)[a,b]	88 (58.7)[c]	
Placental rest	3 (5.8)[a]	3 (7.9)[a,b]	20 (13.3)[c]	
Surgical site infection	2 (3.8)[a]	2 (5.3)[a,b]	16 (10.7)[c]	
Endometritis	1 (1.9)[a]	1 (2.6)[a,b]	14 (9.3)[c]	
Bleeding	2 (3.8)[a]	1 (2.6)[a,b]	12 (8)[c]	
Birth weight (g)	3106.53±617.3[a]	3349.21±378.67[b]	3147.2±405.12[a,c]	**0.012**
APGAR score in 1st minute	8 (5-9)	8(7-9)	8 (5-9)	0.054
APGAR score in 5th minute	9 (7-10)[a]	9(9-10)[b]	9 (7-10)[a,b]	0.120
NICU				0.381
Yes	13 (25)	5 (13.2)	32 (21.3)	
No	39 (75)	33 (86.8)	118 (78.7)	

a,b,c: Groups with different letters are significantly different from each other. Bonferroni and Tukey were used as posthoc tests to show differences among groups

plications during pregnancy and delivery. Approximately 10-30% of women diagnosed with leiomyoma develop complications during pregnancy (3). The biological basis of the association between complications during pregnancy and childbirth and uterine leiomyomas is unclear.

Some studies suggest that leiomyomas located posterior to the placenta or in the lower uterine segment increase the likelihood of birth complications (9,10). Uterine leiomyomas may also decrease uterine dilation, resulting in difficulties that limit fetal movement or decrease the force of contractions. The results of studies on performing myomectomy during cesarean section are conflicting (6,7). In the patients in whom myomectomy was performed during cesarean section, blood loss was higher and operative time was longer. The need for transfusion and the incidence of postoperative complications including uterine atony were higher in these women (7). Some authors point out that myomectomy during cesarean section reduces the risks and costs of reoperation. Myomectomy increases the quality of life and reduces postpartum complications caused by leiomyomas (8). In our series, myomectomy during cesarean section prolonged the operation time and increased blood loss. In addition, myomectomy was performed during cesarean section in 8 (88.8%) of the patients who developed atony.

When we compare the transfusion need among the groups, it was found highest in the myomectomy during cesarean section group with a rate of 36%. Although the rate of blood transfusion was found 28.8% (15/52) in the vaginal delivery group, which was quite high, this might be the result of the prepartum low hemoglobin levels of the women in this group.

In the study by Ciavattini et al. involving 219 pregnant women with and without leiomyomas, it was reported that PPROM was more common in leiomyomas larger than 5 cm, PL and cesarean section were more common in cases with 2 or more leiomyomas (11). Similarly, in the study by Shavell et al, which included 95 pregnant women with and without uterine leiomyomas, it was observed that in pregnant women with large leiomyomas (≥5 cm) delivered at earlier gestational weeks; PL and PPROM occurred more frequently and estimated blood loss and transfusion requirements were high (12). In our study; obstetric complications, blood loss, and transfusion requirements did not show significant differences according to the size of the leiomyoma. The small number of women who had leiomyoma size of ≥7 cm and the different cut-off values in studies for the leiomyoma size could be the reason for different results between our series and previous reports.

In the study by Lam et al, PL was found to be more common in patients with ≥2 leiomyomas than in patients with a single leiomyoma. The rate of cesarean delivery has been shown to be higher in patients with cervical localized leiomyomas than in patients with corpus-localized leiomyomas. The diagnosis of postpartum hemorrhage was more common in patients with a myoma size of >10 cm than in those with a myoma size of 4-7 cm and 7-10 cm (13). Similarly, the retrospective study by Lai et al found that the risk of cesarean delivery, breech presentation, presentation anomaly, PL, placenta previa, and postpartum hemorrhage was increased in patients with leiomyomas. There was no statistically significant difference between the cesarean section rate in patients with leiomyoma size of < 10 cm and those with ≥10 cm (14). In our study, obstetric complications did not show significant differences according to the size of the leiomyoma; while PL, PPROM, IUGR, placenta previa, and uterine atony were more common in the women with ≥2 leiomyomas. The rate of placental abruption is higher among those with single leiomyoma. While there were no differences in terms of gestational age at birth, birthweight, operation time, and obstetric complications depending on the location of the leiomyoma, blood loss was more in women with intramural leiomyomas compared to other groups. In a population-based study by Sheiner et al, nulliparity, chronic hypertension, diabetes mellitus, and advanced maternal age were found to be significantly associated with leiomyomas (15). In our study, the relationship between chronic diseases and leiomyomas could not be evaluated because pregnant women with comorbidities were not included in the study.

The study by Exacoustos et al found that the diagnosis of placental abruption was significantly more frequent with leiomyomas, especially when the leiomyoma volume was greater than 200 cm^3, which were submucosal and overlapped by the placenta (16). Our study found no statistical significance between the size, number, and location of leiomyomas and placental abruption. In the study by Vergani et al, it was found that the incidence of cesarean delivery (23% versus 12%) was higher in patients with lower-segment leiomyomas and a size greater than 5 cm (17). In our study, the rate of cesarean section was 78.4%. The cesarean myomectomy was performed in 150 of 188 patients. No relationship was found between the number, size, location, and type of leiomyoma and the incidence of cesarean section. In the study conducted by Stout et al, the risk of placenta previa, PPROM, and intrauterine fetal death was higher in patients with a leiomyoma size of >5 cm (18). In another study, Coronado et al. found that 5 min APGAR scores <7 and low birth weight (<2500 g) were more frequent in neonates of the women having leiomyomas compared to the control group (4). In our study, the leiomyoma's number, size, and location did not affect the APGAR score. In terms of leiomyoma size, the group with leiomyomas ≥7 cm was found to have a smaller gestational week at delivery and lower birthweight, longer operation time, and higher NICU admission rate compared to the group with leiomyomas <4 cm. Preterm delivery in women with large leiomyomas may result in low birth weight and an increased need for NICU. Myomectomy for large leiomyomas might have prolonged the operation time.

In the study by Conti et al, it was found that the length of hospital stay (3.6 vs. 3.2 days) was similar in women with and without leiomyomas (19). In our study, the mean duration of hospital stay was 2.44 days. The length of hospital stay was significantly different between women with cesarean myomectomy and cesarean delivery (2.48±0.74 days vs. 2.28±0.45 days). Additional surgical procedures may have resulted in prolonged hospitalization.

Retrospective design and obtaining data from medical records are the possible limitations of our study. Another weakness of our study was the small number of the study population. Prospective studies with large sample sizes are needed to support our study results.

Conclusion

The results of our study showed that the increased size and number of uterine leiomyomas were associated with preterm birth and low birth weight in pregnant women. It was also found that women with leiomyomas ≥7 cm had a longer operation time and a higher rate of need for NICU. Myomectomy during cesarean section was found to be associated with increased blood loss, transfusion need, longer operation time, and hospital stay. Therefore, pregnant women with leiomyoma should be counseled about the maternal and perinatal complications in detail and closely monitored during pregnancy and delivery.

Declarations

Ethics approval and consent to participate: All participants signed informed written consent for using data in the study. The study was reviewed and approved by the ethics committee of Etlik Zubeyde Hanim Women's Health and Training Hospital (Ethics approval reference number: 2022/126 date 07.09.2022). All procedures were performed according to the Declaration of Helsinki.

Availability of data and materials: The data supporting this study is available through the corresponding author upon reasonable request.

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