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FETO-MATERNAL OUTCOMES IN PREGNANCY WITH FIBROIDS: A DESCRIPTIVE CASE SERIES STUDY

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ABSTRACT:
Background: Fibroids, which are the most frequent type of benign tumor found in women of childbearing age, may complicate pregnancy. The aim of this study was to evaluate the incidence of adverse maternal/fetal events in pregnancies associated with uterine fibroids
Methods: This Descriptive case-series was conducted at CMH Gujranwala, Pakistan; Duration from October 2025 to March 2026. 285 participants were included in the study. Maternal outcome (negative event) will have been one or more of the following based on maternal/fetal history: spontaneous abortion, low-lying placenta, abnormal fetal position, caesarean delivery, and PPH. The fetal outcomes (negative events) will be as follows: IUGR, preterm delivery, and admission to NICU. The collected data were analyzed using SPSS. Continuous variables were presented as mean ± SD or median (IQR), and categorical variables as frequencies and percentages. Chi-square test was applied with a p-value<0.05 as significant.
Results: The mean age was 29.71 years (±6.37) with a mean gestational age of 24.60 weeks (±9.59). Common complications of pregnancy were spontaneous abortion (15.4%), malpresentation (20.7%), preterm birth (16.1%), intrauterine growth restriction (20%), cesarean section (47.4%), postpartum hemorrhage (10.9%), and neonatal intensive care unit (NICU) admission (14.4%). In addition, larger fibroids (>10 cm) were significantly associated with increased cesarean section rates (61.7%, p=0.009), postpartum hemorrhage (p<0.001), and NICU admission (p=0.030). Posterior fibroids showed significant associations with cesarean delivery (54.8%, p=0.004), low-lying placenta (p=0.037), and previous preterm labor (p=0.012).
Conclusion: Uterine fibroids, particularly large and posterior ones, were significantly associated with negative feto-maternal outcomes. Early risk stratification and careful antenatal surveillance are necessary to improve pregnancy outcomes.

KEYWORDS: Caesarean Section; Fibroid; Post-Partum Hemorrhage; Pregnancy; Preterm Birth.

INTRODUCTION:

Fibroids, which are the most frequent type of benign tumor found in women of childbearing age, may complicate 1.6% to 10.7% of pregnancies around the world.(1). The global age-standardized incidence rate for fibroids was estimated at 250.93 per 100,000 women in 2021, and there has been a trend of increasing incidence (the estimated annual percentage change [EAPC] was 0.24), particularly among women aged 35-39(2). During pregnancy, fibroids can grow larger in size due to hormonal influences and lead to complications for both the baby and mother, such as preterm birth, miscarriage, malpresentation, postpartum hemorrhage (PPH), and an increased likelihood of delivering by cesarean section. On a global scale, women with fibroids also face an independent 52% increased odds (the adjusted odds ratio is 1.52) for delivering by cesarean section, 498% increased odds (the aOR is 4.98) for experiencing PPH, and 99% increased odds (the aOR is 1.99) for experiencing malpresentation.(3).
Incidence rates for fibroids during pregnancy in Pakistan are approximately 0.8 %, with 53.5% cesarean section rates; there is also a relatively high rate of preterm births (31.6 %) and instances of malpresentation (35.8 %)(4). Various published research has shown rates of miscarriage (14 %), oligohydramnios (22.2 %), and intrauterine growth restriction (21 %)(5,6). Rates of postpartum hemorrhage (PPH) in the surrounding area range from 24 % - 28 %, resulting in an elevated risk in South Asian populations. The incidence of threatening pre-term labor (21.8 %) is higher for women with submucosal fibroids or those with larger fibroids (>5cm)(7).
Characteristics of fibroids (size, number, location) have been associated with pregnancy outcomes based on research using descriptive case series study designs, sufficient studies to correlate this data with pregnancy outcomes do not exist within the region, particularly in lower and middle-resource cities like Gujranwala. In this descriptive case series study conducted at a tertiary care hospital located in Gujranwala, the impact of fibroids on feto-maternal outcomes during pregnancy has been evaluated based on local information. This study fills

gaps in existing evidence from Pakistan regarding how best to develop antenatal care protocols and risk stratification so as to deliver optimal care.

METHODOLOGY:

The Gynecology Department of CMH Gujranwala conducted this study: an observational case series over a 6-month period subsequent to obtaining CPSP approval for the study synopsis. Using the WHO calculator to determine the sample size at 285 women, we assumed 95 percent confidence, a population proportion of 10 percent for low placentation, and a margin of error of 3.5 percent(8). A non-probability consecutive sampling method was used to recruit these women,

Inclusion criteria: All of whom had a singleton pregnancy with a prior diagnosis of uterine fibroids at the first booking appointment at approximately 8 weeks pregnant (8 weeks old).

Exclusion criteria: Women who had experienced multiple pregnancies, had pre-existing medical conditions like chronic hypertension, diabetes, renal insufficiency, or had a uterine anomaly (bicornuate uterus) were excluded.

The study was approved by the Institutional Ethical Board prior to implementation, and informed and written consent was obtained from all participants after an explanation of the study's goal and the assurance of confidentiality was provided. Baseline demographic characteristics, including age, parity, and gestational age, were recorded. Fibroid characteristics were documented via clinical examination and ultrasound, including fibroid size and site of fibroid (anterior, posterior, or lateral wall) as well as the number of fibroids. Participants underwent routine antenatal

assessment; data was collected through routine clinical assessments and documented using ultrasound until 40 weeks of pregnancy or delivery (whichever occurred first).

Maternal outcomes that were evaluated included spontaneous abortion (loss of pregnancy prior to 24 weeks), low-lying placenta (placenta edge located within 2 cm of the internal os at the time of 32 weeks), fetal malpresentation (breech/transverse/oblique positioning), mode of delivery (vaginal/cesarean), and postpartum hemorrhage (blood loss > 500 ml after vaginal delivery; blood loss > 1000 ml after C-section; blood loss with hemodynamic instability within 24 hours). Fetal outcomes were assessed as follows: intrauterine growth restriction (fetal weight < 10th percentile for gestational age); preterm birth (delivery at 24 through 36+6 weeks); and/or admission to a NICU within 24 hours of birth.

A proforma was designed for recording data. The statistical analysis was carried out using SPSS (Statistical Package for Social Sciences) version 25. The Shapiro-Wilk test was used to assess normality. Age(p-value<0.001) and gestational age were non-normal(p-value<0.001). The quantitative values of age, gestational age, size of fibroid, and number of fibroids were expressed as means ± standard deviations or median (IQR), while the qualitative values for parity, site of fibroid, outcome for the mother and fetus were expressed as frequency and percentages. Possible confounding variables of age, parity, gestational age, size, and site of fibroids were controlled through stratification. Once stratification was completed, the chi-square test was used to measure the association between variables, with a p-value < 0.05 being statistically significant.

RESULTS:

The sample size consisted of 285 women who were pregnant with a mean age of 29.71±6.37 years and a mean pregnancy gestation of 24.60 weeks±9.59 weeks.

Table I: Descriptive Statistics of Quantitative Variables (n = 285)

Variable	Mean ± SD	Median (IQR)
Age (years)	29.71 ± 6.37	29.00 (12.00)
Gestational Age (weeks)	24.60 ± 9.59	25.00 (16.00)

Most of these women were diagnosed as having medium-sized fibroids (40.4%) that were located on the back side (47.4%), and had multiple fibroids (58.9%), compared to single fibroids.

There were several obstetric complications among these patients, including spontaneous abortion 15.4%, low-lying placenta 11.2%, malpresentation 20.7%, pre-term delivery 16.1%, and intrauterine growth retardation 20%. Almost half (47.4%) of the women delivered by cesarean section, while postpartum hemorrhage occurred in (10.9%) of the deliveries, and (14.4%) of infants were admitted to the NICU after birth.

Table II: Frequency Distribution of Study Variables (n = 285)

Variable	Category	n (%)
Parity	0	65 (22.8)
	1	56 (19.6)
	2	50 (17.5)
	3	49 (17.2)

	4	65 (22.8)
Gravida	0	38 (13.3)
	1	49 (17.2)
	2	54 (18.9)
	3	51 (17.9)
	4	64 (22.5)
	5	29 (10.2)
Fibroid Size	Small (<5 cm)	89 (31.2)
	Medium (5–10 cm)	115 (40.4)
	Large (>10 cm)	81 (28.4)
Fibroid Site	Anterior	91 (31.9)
	Lateral	59 (20.7)
	Posterior	135 (47.4)
Number of Fibroids	One	117 (41.1)
	Multiple	168 (58.9)
Spontaneous Abortion	Yes	44 (15.4)
	No	241 (84.6)
Low-Lying Placenta	Yes	32 (11.2)
	No	253 (88.8)
Malpresentation	Yes	59 (20.7)
	No	226 (79.3)
Mode of Delivery (C-section)	Yes	135 (47.4)
	No	150 (52.6)
Postpartum Hemorrhage	Yes	31 (10.9)
	No	254 (89.1)
IUGR	Yes	57 (20.0)
	No	228 (80.0)
Preterm Labor	Yes	46 (16.1)
	No	239 (83.9)
NICU Admission	Yes	41 (14.4)
	No	244 (85.6)

IUGR= Intrauterine Growth Restriction, NICU= Neonatal Intensive Care Unit

The correlation between the size of fibroids and selected maternal and neonatal outcomes is examined in Table III. As the size of the fibroids increases, so does the rate of cesarean delivery; the rate of cesarean delivery for small fibroids (37/89; 41.6%) was similar to that for medium fibroids (48/115; 41.7%), but the rate of cesarean delivery for women with large fibroids (50/81; 61.7%) was significantly higher than the other two groups (p=0.009).

The association between postpartum hemorrhage and fibroid size was also positive; there were only five postpartum hemorrhage cases for women with small fibroids and 19 postpartum hemorrhage cases for women with large fibroids, and the difference is statistically significant with a p-value <0.001. The number of NICU admissions was also significant, with 19 NICU admissions for infants born to women with large fibroids and 11 NICU admissions for infants born to women with small fibroids (p=0.030). Thus, it appears that having larger fibroids increases the risk of maternal and neonatal complications.

Table III: Association of Fibroid Size with Maternal and Neonatal Outcomes (n = 285)

Outcome	**Small (<5 cm)**	**Medium (5–10 cm)**	**Large (>10 cm)**	**p-value**
C-Section				**0.009**

Yes	37	48	50	
No	52	67	31	
Postpartum Hemorrhage				**<0.001**
Yes	5	7	19	
No	84	108	62	
NICU Admission				**0.030**
Yes	11	12	19	
No	78	103	62	

Chi square test was used. p-value<0.05 considered significant

Table IV shows the relationship between fibroid position and specific outcome variables. Cesarean sections were done most often for posterior fibroids, resulting in a CC rate of 54.8% (74/135) compared to anterior (33.0%, 30/91) and lateral (52.5%, 31/59) fibroids, where a statistical difference was noted (p = 0.004).

A large number of placentas were found to be low-lying for subjects with posterior fibroids, at 16.3% (22/135). There were significantly fewer instances of low-lying placentas for both anterior (6.6%, 6/91) and lateral fibroids (6.8%, 4/59), with a statistically significant p-value of 0.037. The occurrence of premature labor was found to be higher for subjects with posterior fibroids, with an occurrence rate of 23.0% (31/135). There were statistically significant differences between groups associated with premature labor (p = 0.012). Posterior fibroids may therefore be associated with increased risks for poor maternal and neonatal outcomes.

Table IV: Association of Fibroid Site with Maternal and Neonatal Outcomes (n = 285)

Outcome	**Anterior**	**Lateral**	**Posterior**	**p-value**
C-Section				**0.004**
Yes	30	31	74	
No	61	28	61	
Low-Lying Placenta				**0.037**
Yes	6	4	22	
No	85	55	113	
Preterm Labor				**0.012**
Yes	9	6	31	
No	82	53	104	

Chi square test was used. p-value<0.05 considered significant

DISCUSSION:

The findings from this descriptive case series study of 285 pregnant women identified that certain types of uterine fibroid characteristics defined in this report were significantly associated with higher rates of poor maternal-fetal outcomes, specifically higher rates of cesarean delivery (47.4%), postpartum hemorrhage (PPH; 10.9%), preterm labor (16.1%), intrauterine growth restriction (IUGR; 20.0%), and admission to the neonatal intensive care unit (NICU; 14.4%). With respect to size, fibroids greater than 10 cm in size were associated with increased risk of cesarean delivery (61.7%, p=0.009), and increased risk of experiencing PPH (p<0.001), and needing NICU admission (p=0.030). Conversely, fibroids located posteriorly were associated with having a greater risk of needing cesarean delivery (54.8%, p=0.004), having a low-lying placenta (16.3%, p=0.037), and experiencing preterm labor (23.0%, p=0.012).

Our conclusion that hysterectomy rates increased as the size of uterine fibroids increased from 41.6% in small (<5 cm) fibroids to 61.7% in larger (>10 cm) fibroids closely matches a 2025 cohort of 651 pregnancies in

which the use of cesarean delivery also increased stepwise along with the fibroid size and was due to an increased likelihood of malpresentation and obstructed labor for fibroids >10 cm ($p<0.001$)(9). Similarly, a meta-analysis conducted in 2024 showed that the odds of a cesarean delivery increased by more than twofold with fibroids ≥ 5 cm (odds ratio (OR) = 2.09) and attributed this to the fibroids distorting the anatomy of the uterus and thereby making vaginal delivery more difficult(10). However, there was no increase in rates for medium-sized (41.7%) compared to small-sized uterine fibroid pregnancies. This contrasts sharply with a multi-institutional study, which showed that having a fibroid between 5-10 cm was associated with 1.7 times greater rates of cesarean deliveries compared to having a fibroid that was less than 5 cm. One possible explanation for this discrepancy is that our younger (average age 29.71) and earlier (average gestational age of 24.6 weeks) cohorts would have been able to receive earlier therapeutic intervention to prevent future complications. This difference highlights the importance of size-stratified counseling for choosing between instrumentation or non-instrumentation methods for delivery. Moreover, the $p = 0.009$ significance represented by our results supports the use of pre-conception myomectomy for large fibroids (≥ 5 cm) and is consistent with the 2021 Omani study, where 19.5% of myomectomies performed were for >5 cm lesions requiring myomectomy prior to undergoing a cesarean(11).

In our larger fibroid group, there were 19 incidents of PPH, compared to only 5 incidents of PPH in the smaller fibroid group. The difference is highly statistically significant ($p<0.001$). A 2025 retrospective study found a similar correlation between the incidence of PPH and the size of the fibroid(12). In their study, the incidence of PPH in women with fibroids larger than 10 cm was 30.6% while the incidence of PPH in women with fibroids smaller than 5 cm was 1.3% ($p<0.001$), which was attributed to impaired myometrial contractility. In 2024, another meta-analysis confirmed that larger fibroids have a greater risk of developing PPH due to vascular distortion, which is further substantiated by a subgroup analysis demonstrating PPH incidence being notably higher in combinations of ≥ 5 cm and <5 cm than in smaller fibroids(13). Our PPH rates are higher than the Omani cohort for large fibroids of 19.5%, likely due to the higher number of women with multiple fibroids (58.9%), for whom the literature indicates there is an additive effect of atony due to multiple fibroid patient population on PPH, even though certain meta-analyses do not report independent multiplicity effects. These authors suggest this is consistent with the use of intraoperative hemostatic methods for women with large fibroids at the time of cesarean delivery due to the difficulty of managing bleeding from women with multiple large fibroids via conservative methods.

Our rates of cesarean delivery (54.8%), low-lying placenta (16.3%), and preterm labor (23.0%) were highest among women with posterior fibroids, with all statistical significance levels consistent (p-values) and only partially mirroring 2024 results suggesting that fibroid location affects the incidence of placenta previa, but there is no consistent pattern for the rate of postpartum hemorrhage. Supporting data from a 2025 cohort in China demonstrated that women with submucosal and/or posterior fibroid(s) had higher rates of cesarean delivery (67.6% for fibroid size ≥5 cm), attributed to the fact that the fibroid(s) interfered with implantation. This compares to a low-lying placenta rate of 16.3% for women with posterior fibroid(s), versus 6.6% for women with anterior fibroid(s)(14). The large excess of preterm labor in our patients with fibroids is difficult to reconcile with the 2022 meta-analyses suggesting a fibroid-to-preterm labor odds ratio of 1.66, not taking into consideration fibroid location, leading to a hypothesis that posterior fibroids, causing distortion of the lower uterine segment, lead to the observed shortening of the cervix(15). The novelty of identifying posterior fibroids as an exclusive risk, as compared to prior studies that focused on the size of the fibroids, suggests that the presence of posterior fibroids warrants site-specific surveillance because women with anterior and/or lateral fibroids had a lower rate of cesarean delivery (33.0% to 52.5%)(16).

Study found an increase in NICU admission for those with large fibroids as compared to those without (19/81 cases versus 62/213); this relationship was also seen in 2025 data that showed NICU needs increased for those with fibroids greater than 10 cm, (34.1% vs 13.5%; $p<.001$), which could be related to short and long-term effects of in utero growth restriction (20% in our analysis) and pre-term delivery(17). The overall percentage of NICU admissions in our study (14.4%) was similar to previously published rates between 2023 and 2025 (7.7% to 9.5%) and greater than the rates of patients without fibroids. The presence of multiple fibroids (58.9%) may increase the potential for hypoxia to occur in the neonate (e.g., due to in utero growth restriction) compared to patients who had only one fibroid. The rate of IUGR/malpresentation in our study (20.7%) is consistent with the results of recent meta-analyses that demonstrate an increased odds ratio associated with IUGR/malpresentation in those with large or multiple fibroids(17,18). However, due to the even distribution of parity in our study, the potential confounding effect of age from other studies that have examined parity will be diminished in our analysis. Size was demonstrated to be associated with higher NICU risk in the neonate, although there is still debate regarding whether the presence of multiple fibroids is an additional risk factor; therefore, it is possible that the greater number of fibroids we found may explain the differences in our findings when compared to studies that did not report a difference.

The combination of multivalued fibroid cases (58.9%) is much greater than single minimums (41.1%). Additionally, the multivalued fibroid cohort corresponds with the 2025 cohort findings that more cases of fibroids were related to complications in patients who were delivering premature or had growth restriction, but not independent blood loss or cesarean, due to meta-subgroups of cohorts. Furthermore, the 2022 systematic review found that having more than one fibroid increases an individual's risk of delivering prematurely with an

overall odds ratio of 1.66, which is congruent with our overall results; however, our measured sizes and locations are more specific than other analyses and confirm our assumption for assessment of burden of disease (versus count/presence)(19,20).

Limitations of Study:

Due to the fact that this is a descriptive case series study completed at mid-pregnancy, there is a risk of selection bias creating inflated complication rates compared to what would have existed in a cohort study with an ability to control for other variables that could have also been contributing factors (i.e, BMI, ethnicity). In addition, because data was obtained from one center and used a relatively young, developed, and multipara population, we cannot generalize our results, and the absence of volume limits our analysis of degeneration. Therefore, additional studies of multivalued fibroids using both longitudinal and MRI phenotyping are needed.

CONCLUSION:

In summary, pregnancy with uterine fibroids presents a significant risk for maternal and fetal complications. The current study has found that women with fibroids are at increased risk for cesarean delivery, postpartum hemorrhage, preterm labor, intrauterine fetal growth restriction, and admission to the neonatal intensive care unit. The risk for these complications is further increased in women with large (>10 cm) fibroids and posteriorly positioned fibroids, suggesting that both the size and location of fibroids are important factors in determining pregnancy outcomes. Early identification of uterine fibroids, close monitoring of pregnant women with uterine fibroids, and individualized treatment plans are necessary to maximize the chances of a positive outcome for the mother and baby. Risk assessment and appropriate obstetric planning in women with uterine fibroids can minimize complications and enhance fetal and maternal outcomes.

REFERENCES:

1. Handa N, Anjali. Fetal maternal outcomes of fibroid in pregnancy: a retrospective observational study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2023; 12(10): 3080–5. https://doi.org/10.18203/2320-1770.ijrcog20232951
2. Cao Y, Guo Y, Long Z, Wu Y, Pei B, Ye J, et al. The Global Burden of Gynecological Diseases from 1990 to 2019. American Journal of Preventive Medicine. 2024; 67(5): 698–704. https://doi.org/10.1016/j.amepre.2024.06.022
3. Giuliani E, As-Sanie S, Marsh EE. Epidemiology and management of uterine fibroids. International Journal of Gynecology & Obstetrics. 2020; 149(1): 3–9. https://doi.org/10.1002/ijgo.13102
4. Khan MQ, Akhtar Z, Naib JM. Uterine Fibroids in Pregnancy. Journal of Gandhara Medical and Dental Science. 2022; 9(3): 30–3. https://doi.org/10.37762/jgmds.9-3.314
5. Tîrnovanu MC, Lozneanu L, Tîrnovanu ȘD, Tîrnovanu VG, Onofriescu M, Ungureanu C, et al. Uterine Fibroids and Pregnancy: A Review of the Challenges from a Romanian Tertiary Level Institution. Healthcare. 2022; 10(5): 855. https://doi.org/10.3390/healthcare10050855
6. Iftikhar A, Mubeen S, Leghari N, Rauf N, Parveen A, Nisar M. Obstetric outcomes in females with uterine fibroids: A study in a tertiary care hospital. Biological and Clinical Sciences Research Journal. 2023; 2023(1): 316. https://doi.org/10.54112/bcsrj.v2023i1.316
7. Sefah N, Ndebele S, Prince L, Korasare E, Agbleke M, Nkansah A, et al. Uterine fibroids - Causes, impact, treatment, and lens to the African perspective. Frontiers in Pharmacology. 2023; 13: 1045783. https://doi.org/10.3389/fphar.2022.1045783
8. Chineduani V, Ani VC, Ogabido CA, Okpala BC. Coexisting fibroid in pregnancy and its labour outcome in Nigeria. World Journal of Advanced Research and Reviews. 2022; 16(1): 844–50. https://doi.org/10.30574/wjarr.2022.16.1.1090
9. Sharma A, Sharma D. Feto-Maternal Outcomes in Fibroid Complicating Pregnancy Over 1 Year at SMGS Hospital, Jammu: A Retrospective Data Analysis. European Journal of Cardiovascular Medicine. 2025; 15: 525–9. https://doi.org/10.61336/EJCM/25-09-85
10. Li H, Hu Z, Fan Y, Hao Y. The influence of uterine fibroids on adverse outcomes in pregnant women: a meta-analysis. BMC Pregnancy and Childbirth. 2024; 24(1): 345. https://doi.org/10.1186/s12884-024-06545-5
11. Al Sulaimani R, Machado L, Al Salmi M. Do Large Uterine Fibroids Impact Pregnancy Outcomes? Oman Medical Journal. 2021; 36(4): e292. https://doi.org/10.5001/omj.2021.93
12. Wu J, Zhang X. Association of uterine fibroids with adverse pregnancy outcomes: a retrospective cohort study. BMC Pregnancy and Childbirth. 2026; 26: 154. https://doi.org/10.1186/s12884-026-08654-9
13. Yaghoubian YC, Prasannan L, Alvarez A, Gerber RP, Galagedera N, Blitz MJ. Fibroid size and number and risk of postpartum hemorrhage. American Journal of Obstetrics and Gynecology. 2023; 229(3): 344–5. https://doi.org/10.1016/j.ajog.2023.05.001
14. Dayanan R, Duygulu Bulan D, Ayas Ozkan M, Karabay G, Seyhanli Z, Beydilli Sural E, et al. Influence of uterine fibroid size on perinatal and neonatal outcomes: a single-centre cohort of 651 pregnancies. BMC Pediatrics. 2025; 25(1): 750. https://doi.org/10.1186/s12887-025-06133-2
15. Landman AJEMC, Don EE, Vissers G, Ket HCJ, Oudijk MA, de Groot CJM, et al. The risk of preterm birth in women with uterine fibroids: A systematic review and meta-analysis. PLoS One. 2022; 17(6): e0269478. https://doi.org/10.1371/journal.pone.0269478

16. Ramasauskaite D, Purandare N, Diaz I, Kvederaite-Budre G, Beyuo TK, Beyeza-Kashesya J, et al. Fibroids and pregnancy. International Journal of Gynecology & Obstetrics. 2025; 172(1): 51. https://doi.org/10.1002/ijgo.70612
17. Wang X, Wang G, Han R, Gao M, Wang F, Hong Y, et al. Uterine fibroids increase the risk of preterm birth and other adverse birth events: a systematic review and meta-analysis. Translational Pediatrics. 2022; 11(6): 978–86. https://doi.org/10.21037/tp-22-215
18. Kose C, Korpe B, Kinay T, Yilmaz Ergani S, Karadeniz RS, Caglar AT, et al. Maternal and Perinatal Outcomes of Pregnancies with Uterine Leiomyomas. Gynecology, Obstetrics & Reproductive Medicine. 2023; 29(1): 1–8. https://doi.org/10.21613/gorm.2022.1333
19. Karlsen K, Schiøler Kesmodel U, Mogensen O, Humaidan P, Ravn P. Relationship between a uterine fibroid diagnosis and the risk of adverse obstetrical outcomes: A cohort study. BMJ Open. 2020; 10(2): e032104. https://doi.org/10.1136/bmjopen-2019-032104
20. Mitro SD, Peddada S, Chen Z, Buck Louis GM, Gleason JL, Zhang C, et al. Natural history of fibroids in pregnancy: National Institute of Child Health and Human Development Fetal Growth Studies - Singletons cohort. Fertility and Sterility. 2022; 118(4): 656–65. https://doi.org/10.1016/j.fertnstert.2022.06.028