

## Exploring the Relationship between Uterine Fibroids and Adverse Obstetric Outcomes: A Retrospective Cohort Study

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### Abstract

**Background:** Uterine fibroids, or myomas, are benign tumors of smooth muscle in the uterine wall, affecting 20–60% of women of reproductive age. While they are generally asymptomatic, approximately one-third can lead to serious clinical manifestations, necessitating treatment and impacting obstetric outcomes.

**Aim:** The goal of this study was to look into the obstetric outcomes of pregnancies complicated by uterine fibroids and associated complications.

**Methodology:** This hospital-based, retrospective observational cohort study was conducted at Narayan Medical College and Hospital, Bihar, India, involving 82 clinically suspected pregnant women diagnosed with uterine fibroids through prenatal ultrasound. Data collected included demographic, antenatal, intrapartum, and postpartum histories. Obstetric and neonatal outcomes were analyzed using descriptive statistics and multiple logistic regression.

**Result:** The demographic analysis showed a majority of participants aged 26–30 years (45.12%) and experiencing 2 to 3 pregnancies (43.90%). Subserous fibroids were the most prevalent type (68.29%), located primarily in the fundus (73.17%). A significant proportion of pregnancies (86.59%) reached term (37–40 weeks), with cesarean sections being the primary mode of delivery (70.73%). Complications included preterm labor (23.17%) and blood transfusions (20.73%). Notably, low birth weight was observed in 13.41% of cases.

**Conclusion:** The study revealed a notable association between adverse obstetric outcomes and uterine fibroids, particularly concerning preterm labor and low birth weight. These findings highlight the importance of careful monitoring and management of pregnancies affected by fibroids to improve maternal and fetal outcomes.

**Keywords:** Uterine fibroids, obstetric outcomes, pregnancy complications, cesarean section, low birth weight.

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### Introduction

Uterine fibroids, also known as myomas, are non-cancerous, hormone-sensitive tumors of smooth muscle found on the uterine wall, impacting 20–60% of women in their reproductive years. There are several risk factors associated with the development of fibroids, such include behavioral characteristics, uterine infections, age, race, and hormonal impacts; nonetheless, there is inconsistency in the epidemiology data. Generally, these fibroids are asymptomatic, with only about 30% being large enough to be identified by a physician during a physical checkup. Additionally, approximately one-third of these individuals display notable clinical symptoms, requiring medical treatment, such as abnormal menstrual flow, anemia, pelvic

discomfort, back pain, constipation, or infertility. Additionally, fibroids are linked to poorer obstetric outcomes [2].

According to prospective studies that track the size of uterine fibroids during pregnancy using ultrasound technology, more than half of fibroids (between 60% and 78%) do not significantly alter in volume over the course of the gestational period. The majority of the growth in the 22% to 32% of fibroids that did expand in volume happened in the first trimester, especially in the first 10 weeks, with little to no growth seen in the second and third trimesters. Within this group, the volume increased by  $12\% \pm 6\%$  on average, with a maximum growth of 25% [3]. Additional research suggests that the

growth capacity of small fibroids is similar to that of larger fibroids. Nonetheless, certain research indicates that little fibroids could enlarge in the second trimester, although larger fibroids ( $\geq 6$  cm) typically stay the same or even shrink in size. Interestingly, fibroids usually get smaller in the third trimester. While 7.8% of fibroids may decrease by up to 10% during the puerperium, most fibroids do not alter in size during this time [4].

Most fibroids are asymptomatic, but if a fibroid experiences impaction, torsion (which is most frequently observed in pedunculated subserosal fibroids), or "red degeneration," severe localized abdominal pain may result. The main side effect of fibroids during pregnancy is pain, which is especially common in women who have larger fibroids ( $> 5$  cm) in the second and third trimesters. Nine percent of the fibroids in research involving 113 pregnant women showed cystic changes or a heterogeneous echogenic pattern on ultrasonography, which indicated the beginning of red degeneration. Of these women, 70% (7 out of 10) reported having severe abdominal pain; in contrast, only 11.7% (12 out of 103) of women with fibroids who did not have echogenic changes on ultrasonography reported having the same symptoms [5]. The severe discomfort associated with red degeneration has been explained by three main theories. Tissue anoxia, necrosis, and infarction can result from tissue exceeding its blood supply due to rapid fibroid proliferation. Second, even in the absence of fibroid growth, the growing uterus may alter the vascular structure (kinking) that supplies the fibroid, causing ischemia and necrosis. The pain could be the result of prostaglandins being released from the damaged fibroid's cells. This is supported by data showing that prostaglandin synthetase inhibitors, including ibuprofen, rapidly and effectively reduce discomfort associated with fibroid tumors [6].

Fibroids are present in 0.1% to 10.7% of expectant women, and their incidence increases when women elect to delay childbearing until a later age [7]. The extent of uterine fibroids is influenced by pregnancy-related hormones, and fibroids have a variety of effects on pregnancy. In general, women who are pregnant and have uterine fibroids have concerns regarding potential adverse outcomes. Nevertheless, these women typically experience uneventful pregnancies. The relationship among adverse obstetric outcomes and uterine fibroids has been inconsistently reported in numerous studies. Miscarriage, early labor, bleeding during childbirth, improper positioning and presentation, labor obstruction, inversion of the uterus, bleeding after childbirth, and sepsis during puerpera are among the obstetric consequences of co-occurring uterine fibroids during pregnancy [8].

Uterine fibroids, especially those that are numerous, intramural, or submucous, are known to increase the risk of early pregnancy loss [9]. Fibroids positioned in the uterine body have a higher likelihood of causing miscarriages than those located in the lower uterine region. Increased contractility and uterine irritability are identified as factors that may contribute to an elevated risk of pregnancy loss associated with fibroids, which apply compressive pressure and interfere with blood supply to the fetus and placenta. According to the exact spot of the uterine fibroids, the likelihood increases when the placenta connects near a fibroid nodule [10].

Women with uterus fibroids are more likely to have early births and go into labor early during late pregnancies, according to many studies [11]. Uterine myomas do not seem to raise the risk of preterm premature rupture of the membranes, according to epidemiological statistics; however, contradictory findings have been reported in other investigations [12]. In a tertiary hospital setting, the purpose of this study was to look into the obstetric outcomes of pregnancies impacted by uterine fibroids and related problems.

## Methodology

### Study Design

The present study was a hospital-based, retrospective observational cohort study. It was conducted for five months. A total of 82 individuals with clinically suspected pregnant women with uterine fibroid were involved.

### Study Area

The research was carried out at Narayan Medical College and Hospital, Jamuhar, sasaram, Bihar, India, specifically in the Department of Obstetrics and Gynecology (OBGY).

### Inclusion Criteria

Pregnant women diagnosed with uterine fibroid.

Diagnosis confirmed via prenatal or antenatal ultrasonography (USG).

Fibroids documented and evaluated during the study period for one year

### Exclusion Criteria

Women with any of the following conditions were excluded from the study:

A history of previous cesarean sections or surgeries.

Uterine malformations or deformities.

Chronic conditions like diabetes or hypertension.

### Procedure

Data was collected retrospectively from patient records. The recorded information encompassed

demographic data, prenatal, intrapartum, and postpartum histories, clinical examination results, laboratory tests, and ultrasound findings. This encompassed gravidity, parity, maternal age, the quantity and dimensions of fibroids, and the gestational age at birth. The research additionally observed obstetric problems including low birth weight, placenta previa, placental abruption, premature rupture of membranes (PROM), and preterm birth. Neonatal outcomes were recorded, encompassing birth weight, APGAR ratings, resuscitation measures, and admissions to neonatal intensive care units (NICU).

### Statistical Analysis

The data were analyzed using descriptive statistical techniques. Frequencies and percentages were used to represent discrete variables that were entered into Microsoft Excel. The standard and mean deviation were calculated for continuous variables. A multiple

logistic regression analysis was done to look into the connection between perinatal outcomes and fibroid features.

### Result

Table 1 displays demographic profiles of patients classified by age and gravida status. The largest age group of patients is 26–30 years, comprising 45.12%, followed by the 31–35 years age group at 28.05%. The age group of 36–40 years constitutes 18.29%, whereas the 19–25 years group represents 6.10%, and individuals aged 41 years or older make up only 2.44%. In terms of gravida status, 43.90% of patients have experienced 2 to 3 pregnancies (Gravida 2–3), whereas 34.15% are experiencing their first pregnancy (Primigravida). Furthermore, 21.95% of patients are categorized as Gravida  $\geq 4$ , signifying a greater number of pregnancies.

**Table 1: Demographic Profiles of the patients**

Demographic characters	Cases	Percentage
<b>Age (in years)</b>		
$\geq 41$	2	2.44%
36–40	15	18.29%
31–35	23	28.05%
26–30	37	45.12%
19–25	5	6.10%
<b>Gravida status</b>		
Gravida $\geq 4$	18	21.95%
Gravida 2–3	36	43.90%
Primigravida	28	34.15%

Table 2 provides a complete description of uterine fibroids, categorizing them based on type, location, and quantity. In the analysis of 82 cases, subserous fibroids emerged as the predominant type, representing 68.29% (56 cases), followed by submucous fibroids at 19.51% (16 cases) and intramural fibroids at 12.20% (10 cases). The majority of cases were located in the fundus (73.17%, 60 cases), followed by the pedunculated region (21.95%, 18 cases), cervix (2.44%, 2 cases), and tubes (1.22%, 1 case). In terms of fibroid quantity, 47.56% (39 cases) presented with 2 to 3 fibroids, 30.49% (25 cases) exhibited a single fibroid, and 21.95% (18 cases) had more than 3 fibroids.

**Table 2: Characteristics of uterine fibroids**

Features of uterine fibroids	Cases	Percentage
<b>Type of fibroid</b>		
Subserous	56	68.29%
Submucous	16	19.51%
Intramural	10	12.20%
<b>Location of fibroid</b>		
Pedunculated	18	21.95%
Tubes	1	1.22%
Fundus	60	73.17%
Cervix	2	2.44%
<b>Number of fibroids</b>		
$>3$	18	21.95%
2–3	39	47.56%
1	25	30.49%

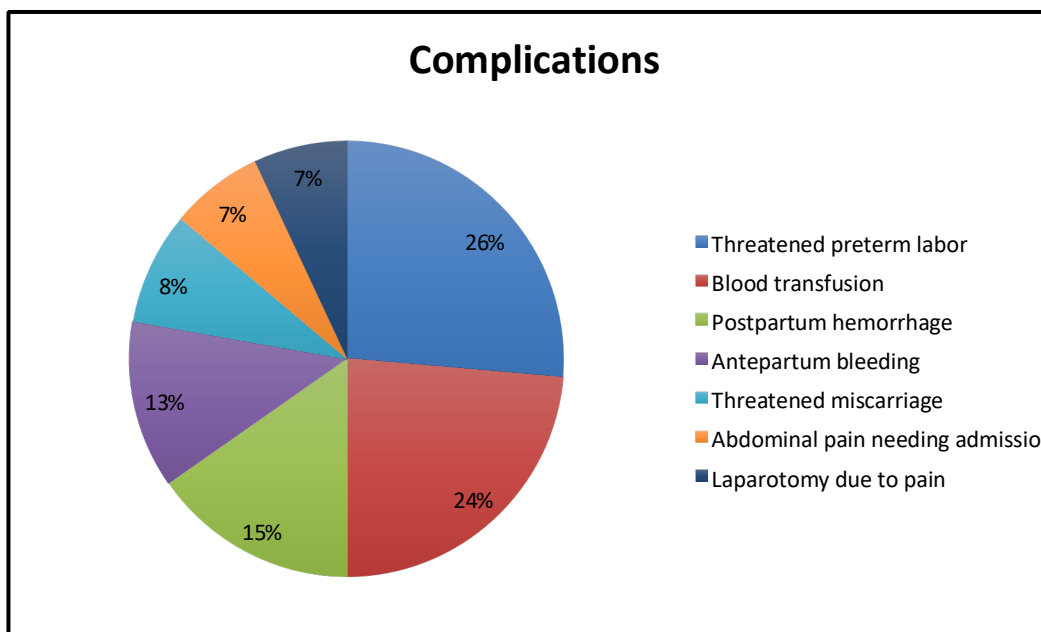
Table 3 shows data on obstetric outcomes and highlights that the majority of pregnancies (86.59%) were terminated between 37 and 40 weeks of gestation, with only 2.44% occurring between 21 and 32 weeks. The primary mode of delivery was the caesarean section, accounting for 70.73%, while normal vaginal delivery constituted 19.51%. In the cohort of 58 cases that underwent caesarean section, the predominant indications included premature

rupture of membranes (PROM) with a low Bishop score (20.69%), uterine inertia (18.97%), and placenta previa (18.97%), while fetal distress was observed in 17.24% of cases. Alternative delivery methods comprised suction and evacuation, hysterectomy, assisted breech delivery, and outlet forceps, representing a minor proportion of the overall deliveries.

**Table 3: Obstetric outcome**

Pregnancy outcome	Cases	Percentage
<b>Gestational age at termination</b>		
≥ 40 weeks	3	3.66%
37–40 weeks	71	86.59%
33–37 weeks	3	3.66%
21–32 weeks	2	2.44%
≤ 20 weeks	3	3.66%
<b>Mode of delivery</b>		
Suction and evacuation	1	1.22%
Hysterectomy	3	3.66%
Assisted breech delivery	1	1.22%
Outlet forceps	2	2.44%
Normal vaginal delivery	16	19.51%
Caesarean section	58	70.73%
<b>Indication for LSCS (n=58)</b>		
Malpresentation	6	10.34%
Non-progressive labor	9	15.52%
Fetal distress	10	17.24%
Uterine inertia	11	18.97%
Placenta previa	11	18.97%
PROM with poor Bishop score	12	20.69%

Figure 1 points out the complications during pregnancy among 52 cases, with the most common being threatened with pre-term labor at 23.17%, followed closely by blood transfusion at 20.73%. Other notable complications include postpartum hemorrhage (13.41%) and antepartum bleeding (10.98%), with threatened miscarriage and abdominal pain requiring admission both at 7.32% and 6.10%, respectively.



**Figure 1: Pregnancy complications (n=52)**

Table 4 represents data on fetal outcomes from a study, emphasizing various complications and their prevalence. Of the total cases, 2 (2.43%) resulted in neonatal death and an equal number in fresh stillborn births. Resuscitation was necessary in five cases (6.10%), and six cases (7.31%) exhibited low

APGAR scores at five minutes. Low birth weight was observed in 11 instances (13.41%), while abortion and NICU admission were each required in 8 cases (9.75%). Low birth weight was identified as the predominant issue, impacting a substantial percentage of the cases.

**Table 4: Fetal Outcome (n=42)**

Fetal Outcome	Cases	Percentage
Neonatal death	2	2.43%
Fresh stillborn	2	2.43%
Required resuscitation	5	6.10%
Low APGAR score at 5 min	6	7.31%
Low birth weight	11	13.41%
Abortion	8	9.75%
Required NICU admission	8	9.75%

### Discussion

The demographic profiles of the patients presented in this current study reveal a diverse age distribution, with the majority falling within the 26–30 years age group, accounting for 45.12% of cases. This is followed by the 31–35 years group at 28.05%, indicating that younger women are more frequently affected. The remaining age categories show a significant decline, with only 18.29% in the 36–40 years range, and smaller proportions in the 19–25 years and 41 years or older groups. Additionally, the gravida status highlights that 43.90% of the patients are in the 2–3 gravida category, suggesting a prevalence of multiparous women, while 34.15% are primigravida. The category of Gravida 4 accounts for 21.95% of the cases, indicating that a substantial number of patients have had multiple pregnancies. In a study by Pullemalla [13], forty pregnant individuals with fibroids who were diagnosed between the ages of 21 and 45 participated. Out of them, 15 had been threatened with miscarriage, 12 had preterm labor, 2 had experienced antepartum bleeding, 3 had been hospitalized due to abdominal pain, 2 had needed laparotomies to manage the pain, 1 had suffered from postpartum hemorrhage, and only 1 patient needed blood transfusions.

The results of the study showed the characteristics of uterine fibroids, which are predominantly subserous in type, representing 68.29% of the cases. This is followed by submucous fibroids at 19.51% and intramural fibroids at 12.20%. In terms of location, the majority of fibroids are found in the fundus (73.17%), with a smaller percentage in the pedunculated (21.95%) and cervical locations (2.44%). Regarding the number of fibroids, 47.56% of patients have 2–3 fibroids, while 30.49% have a single fibroid, and 21.95% present with more than three fibroids. These findings underscore the commonality of certain fibroid types and their locations in the population studied. In a prospective study, Dasgupta et al. examined 15 patients who

were experiencing pregnancy complications due to big fibroids (>5 cm). All of the patients received cesarean sections. The study discovered that 87% of the 34-year-old individuals had a history of infertility, accounting for 53% of the total. In addition, premature births occurred in 46% of the patients. Afzal A et al. conducted a different study with 85 individuals, reporting a mean age of  $32.56 \pm 4.3$  years, with 27.05% of the patients being primigravida and 72.94% being multigravida. In a multicenter analysis of 112,403 women, Zhao et al. [15] found that 3,012 (2.68%) of them had at least one fibroid. The study showed that when fibroid size rose, there was a significant rise in the incidence of postpartum hemorrhage (PPH) ( $P < 0.001$ ). Additionally, the location of the fibroid had a significant impact on the incidence of PPH, with rates of 5.6% for subserosal, 4.7% for submucosal, and 8.6% for intramural fibroids.

The obstetric outcomes were found in this result that the majority of pregnancies (86.59%) reached gestational ages between 37 and 40 weeks, indicating favorable outcomes for a significant portion of the cohort. However, there are also cases of earlier terminations, with 3.66% of pregnancies terminating at or beyond 40 weeks and others between 21–32 weeks. The mode of delivery data reveals that cesarean sections are the most common, comprising 70.73% of deliveries, while normal vaginal deliveries account for only 19.51%. Among the cesarean sections, various indications were noted, with poor Bishop scores and malpresentation being significant contributors to the decision for surgical intervention. Ciavattini et al. [16] investigated the impact of multiple or large fibroids ( $\geq 5$  cm in diameter), as detected via sonography, on obstetric outcomes. Their study included a cohort of 219 women diagnosed with uterine fibroids.

In a study involving 52 pregnancies, various complications were observed, highlighting significant risks associated with maternal health.

The most prevalent issue was preterm labor, affecting 23.17% of the cases, followed by blood transfusions required in 20.73% of the pregnancies, indicating severe hemorrhage or anemia. Other notable complications included postpartum hemorrhage (13.41%), antepartum bleeding (10.98%), and threatened miscarriage (7.32%). Additionally, 6.10% of the pregnancies required hospitalization due to abdominal pain, which resulted in laparotomy in a similar percentage of cases. These findings underscore the importance of monitoring and managing complications during pregnancy to improve maternal and fetal outcomes.

Fetal outcomes, indicate that while the majority of neonates survived, there were instances of neonatal death (2.43%) and fresh stillbirths (2.43%). A total of 13.41% of infants presented with low birth weight, while 9.75% required NICU admission, suggesting some adverse outcomes despite the high percentage of pregnancies reaching term. Additionally, the need for resuscitation (6.10%) and low APGAR scores at five minutes (7.31%) further highlight the complexities faced in managing pregnancies affected by uterine fibroids. Goh et al. (2018) [17] demonstrated that women with fibroids experienced elevated rates of cesarean deliveries and greater occurrences of fetal distress. This is consistent with the present findings, which indicate that Cesarean sections constituted 70.73% of delivery methods. The research conducted by Choi (2024) indicates that low APGAR scores at five minutes have been associated with studies investigating the impact of fibroids on obstetric outcomes, implying that these benign tumors may delivery processes and complicate labor [18].

### Conclusion

In conclusion, this retrospective cohort study highlights a significant relationship between uterine fibroids and adverse obstetric outcomes. The demographic data revealed that younger women, particularly those aged 26-30, represented many participants, while the prevalence of subserous fibroids was notably high. The findings indicated that most pregnancies concluded between 37 and 40 weeks, yet caesarean sections were the predominant mode of delivery, often due to complications like premature rupture of membranes and uterine inertia. Furthermore, difficulties that arise during pregnancy were prevalent, with blood transfusions and preterm labor being the most common. The fetal outcomes also raised concerns, particularly regarding low birth weight, which affected a significant portion of the cohort. Overall, these results underscore the need for careful monitoring and management of pregnancies affected by uterine fibroids to mitigate adverse outcomes.

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