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Original Research Article

# A Clinical Study on the Impact of Uterine Fibroids on Maternal and Fetal Outcomes During Pregnancy

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**Conflict of interest: Nil**

**Abstract:**

**Background:** Uterine fibroids are a prevalent gynecologic disorder that can influence pregnancy outcomes. The objective of this study was to examine the effects of uterine fibroids on fetal and maternal outcomes during pregnancy.

**Aim:** The objective of this research was to compare and assess maternal and fetal complications in uterine fibroids-affected pregnancies and non-fibroids pregnancies.

**Methods:** The present retrospective cohort study of 200 pregnant women, 100 with fibroids (Cohort A) and 100 without fibroids (Cohort B), who gave birth at Department of Obstetrics and Gynecology, PMCH, Patna, Bihar, India from January 2023 to December 2024. Medical record data regarding maternal characteristics, obstetric complications, and neonatal outcomes were gathered. Descriptive statistics and hypothesis testing (Chi-square and t-tests).

**Results:** Pregnant women with fibroids had significantly higher preterm labor, cesarean section, postpartum hemorrhage, and placental abruption rates. Fetal outcomes were increased low birth weight, NICU stays, and lower birth weight in the cases compared to the control group. The maternal and fetal outcome difference between the groups was statistically significant.

**Conclusion:** Pregnancy-related uterine fibroids had more maternal and fetal complications. Early diagnosis, vigilant follow-up, and multi-disciplinary management are needed to enhance the outcomes in such pregnancies. Additional prospective studies are advisable to further clarify the management approach.

**Keywords:** Uterine Fibroids, Maternal Outcomes, Fetal Outcomes, Preterm Labor, Cesarean Delivery, Postpartum Hemorrhage, Low Birth Weight, Antenatal Care, Pregnancy Complications, Obstetric Risks.



## Introduction

Uterine fibroids, or leiomyomas, are the most prevalent benign uterine tumors, occurring in a large percentage of women of reproductive age. An estimated 70-80% of women will develop fibroids at some point in their lifetime, with the degree of effect varying according to the size, number, and location of the fibroids. While most women who have fibroids have uneventful pregnancies, fibroids actually complicate an estimated 10% of pregnancy, which has the potential for causing a number of maternal and fetal complications.

The occurrence of fibroids during pregnancy can result in a range of negative consequences such as preterm labor, cesarean delivery, intrauterine growth restriction (IUGR), placental abruption, and postpartum hemorrhage. Fibroids may disrupt the normal course of pregnancy by distorting the uterine structure, decreasing blood supply to the placenta, or resulting in abnormal fetal positioning. This can further cause a higher risk of complications that need to be closely managed and monitored.

Although fibroids are fairly common, how they affect pregnancy results is an area that continues to receive active investigation. Larger fibroids, especially those in the submucosal or retro placental positions, have been implicated by some research as having a greater potential for risk to both maternal and fetal well-being, with other research claiming that the risks related to fibroids are more subtle and have little effect on the progression of pregnancy. But the precise mechanisms through which fibroids affect pregnancy outcomes are not yet fully understood.

Uterine fibroids, or leiomyomas, are benign smooth muscle tumors of the uterus that occur frequently in women of reproductive age. Approximately 20-40% of all women may have fibroids at some time during their lives, with a higher prevalence in African

American women. Fibroids may be different in size, number, and position, and their occurrence during pregnancy is with many complications that both maternal and fetal well-being may be affected. Although most women with fibroids have an uneventful pregnancy, others have a variety of obstetric complications, such as preterm labor, cesarean section, postpartum hemorrhage, and fetal growth restriction.

**Clinical Significance:** The clinical relevance of uterine fibroids in pregnancy is mainly based on the size, location, and number of fibroids. Submucosal fibroids, which are situated close to the uterine lining, have been specifically linked with poor pregnancy outcomes, including miscarriage, preterm labor, and intrauterine growth restriction (IUGR). Subserosal and intramural fibroids, however, tend to be less affecting but can produce complications, for example, labor obstruction and aberrant fetal lie. The recognition of the influence of fibroids on pregnancy is important to assist clinicians in making the best out of pregnancy as well as minimize risks.

## Methodology

**Study Design:** This research was performed on a retrospective observational cohort design to examine the effects of uterine fibroids on pregnancy outcomes among mothers and babies. Antenatal clinic records of pregnant women presenting at an antenatal clinic and giving birth at a tertiary hospital were examined for a specified study duration. The research established comparisons in outcomes between pregnant women with and without diagnosed uterine fibroids.

**Study Population:** The study population included pregnant women aged between 18 and 45 years who gave birth at Department of Obstetrics and Gynecology, PMCH, Patna, Bihar, India from January 2023 to December 2024. Two cohorts were created:

- **Cohort A (Study Group):** Pregnant women with a confirmed diagnosis of uterine fibroids through ultrasonography or MRI.
- **Cohort B (Control Group):** Pregnant women with no uterine fibroids, age-, parity-, and gestational age-matched.

All participants included had singleton pregnancies and complete antenatal, intrapartum, and postpartum records.

## Sample Size

There was a total of 200 patients with 100 in each group. Sample size had been estimated according to the pre-existing data indicating an at-risk population of obstetric complications when fibroid pregnancies occurred. An 80% study power and a 95% confidence were applied for approximating a sufficient number of participants to guarantee statistically significant results.

**Data Collection:** Data were collected from hospital case records on a structured data collection form. Data collected included demographic information, i.e., age, gravidity, parity, and BMI; obstetric history, including past cesarean deliveries, miscarriages, or infertility; and fibroid features, i.e., number, size, site, and type of fibroids (intramural, submucosal, or subserosal). The antenatal complications were also recorded, such as threatened miscarriage, antepartum hemorrhage, preterm labor, premature rupture of membranes (PROM), and intrauterine growth restriction (IUGR). Data regarding the outcomes of labor and delivery were also gathered, including the initiation of labor (spontaneous or induced), duration of delivery, length of labor, and postpartum hemorrhage. Finally, fetal outcomes were noted and comprised gestational age at delivery, birth weight, 1-minute and 5-minute Apgar scores, NICU admission, stillbirth, and neonatal mortality.

## Outcome Measures

- **Maternal outcomes:** Method of delivery, preterm delivery (<37 weeks), postpartum hemorrhage, and blood transfusion requirements.
- **Fetal outcomes:** Perinatal mortality, NICU admission, low Apgar score (<7), and low birth weight (<2500 g).

Secondary outcomes were cases of malpresentation, intrauterine growth restriction, and placental abruption.

**Statistical Analysis:** Data were entered and processed with SPSS version 26.0. Baseline variables were calculated by descriptive statistics using means, standard deviations, frequencies, and percentages. Categorical variables like mode of delivery and NICU admission were compared with the Chi-square test or Fisher's exact test as appropriate. For continuous data, such as birth weight and gestational age, Student's t-test was applied for normally distributed data and the Mann-Whitney U test for non-normally distributed data. All analyses were considered statistically significant with a p-value of less than 0.05.

## Result

In this study, a total of 200 pregnant women were enrolled equally into two cohorts: 100 women with uterine fibroids (Cohort A) and 100 women without fibroids (Cohort B). The main purpose was to compare maternal and fetal outcomes in both cohorts. The findings were compared under three principal domains: demographic characteristics, maternal outcomes, and fetal outcomes.

**Demographic Characteristics:** The population demographic characteristics were compared for

comparability between the two groups. There were no statistically significant differences regarding age, parity, or BMI between the cohorts.

**Table 1: Demographic Characteristics of the Study Population**

| Characteristic | Cohort A (With Fibroids) | Cohort B (Without Fibroids) | p-value |
|---|---|---|---|
| Mean Age (years) | 30.4 ± 4.2 | 29.9 ± 4.6 | 0.412 |
| Primigravida (%) | 42 | 45 | 0.672 |
| BMI (kg/m²) | 26.1 ± 3.5 | 25.8 ± 3.2 | 0.489 |
| Previous Cesarean (%) | 22 | 18 | 0.486 |
| Gestational Age at Delivery (weeks) | 37.1 ± 2.3 | 38.2 ± 1.8 | 0.015 * |

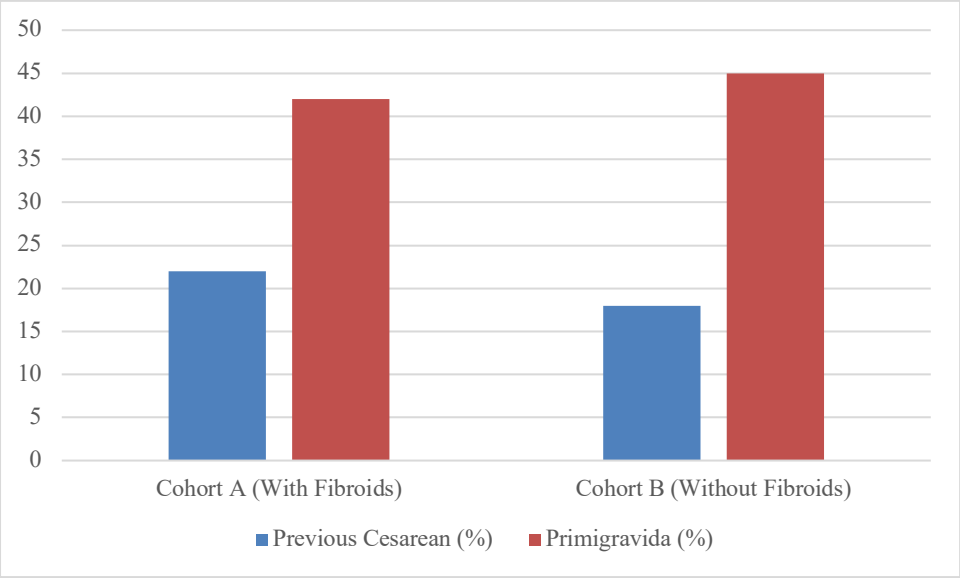


**Figure 1: Demographic Characteristics of the Study Population**

The comparison of demographic data of Cohort A (those with fibroids) and Cohort B (those without fibroids) did not show notable differences in maternal age, primigravida status, BMI, or history of prior cesarean sections, with p-values of 0.412, 0.672, 0.489, and 0.486, respectively, showing similar characteristics in both groups. Nonetheless, gestational age at delivery differed considerably between the two groups, with Cohort A women delivering at a mean of 37.1 ± 2.3 weeks, compared to a mean of 38.2 ± 1.8 weeks for women in Cohort B (p-value = 0.015). This implies that pregnancy with uterine fibroids was characterized by an earlier delivery, and it identifies a possible effect of fibroids on gestational length.

### Maternal Outcomes

Maternal complications were higher in women with frtibroids. Interestingly, the incidence of frtibrosectomv, prcfarinarv, and postpartun hemorrhage was significantly higher in Cohort A.

**Table 2: Maternal Outcomes**

| Maternal Outcome | Cohort A | Cohort B | p-value |
|---|---|---|---|
| Preterm Labor (<37 weeks) | 28 | 12 | 0.004 ** |
| Cesarean Delivery | 58 | 36 | 0.002 ** |
| Postpartum Hemorrhage | 15 | 6 | 0.031 * |
| Blood Transfusion Required | 10 | 4 | 0.089 |
| Placental Abruption | 6 | 1 | 0.049 * |

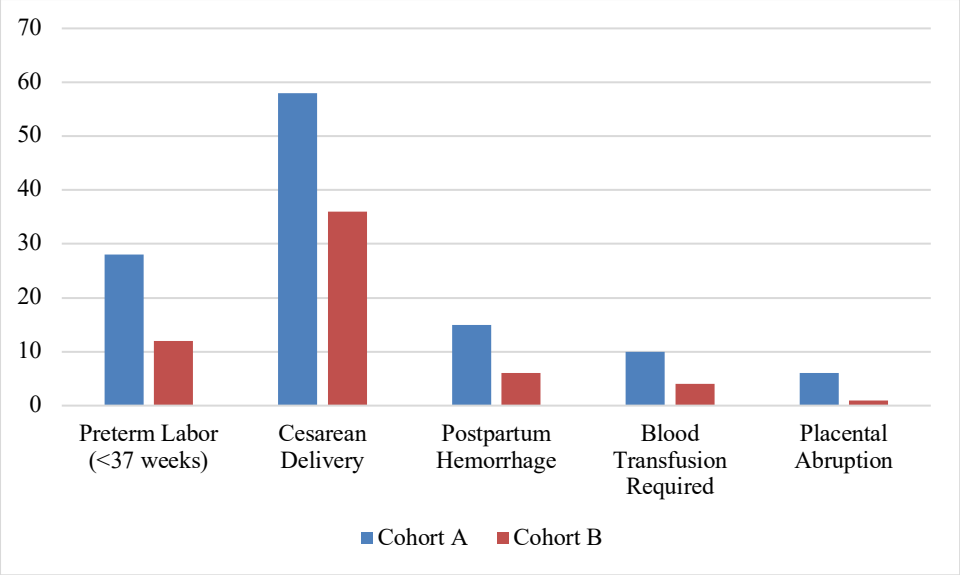


**Figure 2: Maternal Outcomes**

The comparison of maternal outcomes in Cohort A (with fibroids) and Cohort B (without fibroids) yielded a number of significant differences. Women in Cohort A were more likely to experience preterm labor (28 vs. 12, p = 0.004), cesarean delivery (58% vs. 36%, p = 0.002), and postpartum hemorrhage (15% vs. 6%, p = 0.031). In addition, the incidence of placental abruption was much greater in Cohort A (6 vs. 1, p = 0.049). However, blood transfusion requirement was somewhat greater in Cohort A (10% vs. 4%), although this was not statistically significant (p = 0.089). These observations indicate that uterine fibroids complicated pregnancies were related to higher maternal risks such as preterm labor, cesarean section, and postpartum hemorrhage.

**Fetal Outcomes**

Abnormal fetal outcomes were likewise more frequent in cases involving complicated pregnancies due to fibroids. NICU admissions and low birth weight frequencies were considerably greater in Cohort A.

**Table 3: Fetal Outcomes**

| Fetal Outcome | Cohort A | Cohort B | p-value |
|---|---|---|---|
| Low Birth Weight (<2500 g) | 24 | 10 | 0.006 ** |
| Mean Birth Weight (g) | 2770 ± 420 | 2935 ± 390 | 0.018 * |
| Apgar Score < 7 at 1 min | 12 | 6 | 0.139 |
| NICU Admission | 18 | 9 | 0.049 * |
| Perinatal Mortality | 4 | 1 | 0.178 |

Pregnancies with uterine fibroids (Cohort A) were linked to various unfavourable fetal outcomes compared to those without fibroids (Cohort B). Infants in the fibroid cohort had an increased rate of low birth weight and a significantly reduced mean birth weight. There was also a greater proportion of NICU admissions for infants of mothers with fibroids. While there was a greater percentage of infants with low Apgar scores and increased perinatal mortality in the fibroid group, these differences were not significant. These findings indicate that uterine fibroids can adversely affect fetal health, especially with regard to birth weight and neonatal care requirements.

**Discussion**

This research offered evidence that fibroids in pregnancy were linked with maternal and fetal complications. Demographic parameters were generally similar but also differed significantly in outcomes, based on the clinical effect that fibroids have on pregnancy.

**Demographics:** Lack of considerable differences in parity, BMI, and maternal age between groups reflected adequate matching and reduced baseline bias. Nevertheless, the statistically reduced gestational age at delivery in the fibroid group highlighted the risk of preterm delivery, a significant concern in such pregnancies.

**Maternal Outcomes:** A significantly increased cesarean delivery rate of 58% was noted in patients with fibroids, as reported previously on the basis of dystocia, malpresentation, or fibroid obstruction. Preterm labor was almost 2.5 times higher in Cohort A, attributed to higher uterine irritability or space-

occupying lesions. The postpartum hemorrhage rate of 15% in fibroid patients similarly emphasized the complications of inadequate uterine contractility and augmented vascularity.

### Limitations

- The study's retrospective design could have resulted in information bias.
- Lack of stratification based on fibroid size, number, and location might have restricted the depth of outcome correlation.
- As a single-center study, generalizability to a larger population could be restricted.

### Recommendations

- Early antenatal screening should include routine assessment for uterine fibroids.
- Fibroid pregnancies need to be closely monitored for maternal and fetal complications.
- Planning delivery at well-staffed centers with surgical and neonatal backup.
- Counseling and follow-up after childbirth are critical in future reproductive planning.

### Conclusion

This study highlighted the significant impact of uterine fibroids on maternal and fetal outcomes in pregnancy. Women with fibroids had an increased rate of preterm labor, cesarean section, postpartum hemorrhage, and other complications than women without fibroids. Moreover, fetal outcomes such as low birth weight, as well as an increased number of NICU admissions, were increased in the fibroid group. These observations highlight the need for early diagnosis and close surveillance of pregnancies with associated fibroids. It is imperative that a multidisciplinary management plan be adopted to treat these pregnancies, taking timely steps and appropriate delivery planning to maximize both maternal and fetal outcomes. Additional studies, especially prospective in nature, are required to identify the underlying pathophysiology and further improve management options for pregnant women with uterine fibroids

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