

INFLUENCE OF UTERINE FIBROIDS ON MATERNAL AND FETAL OUTCOMES AT DIR LOWER

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Abstract

Uterine fibroids are the most common benign tumors in women of reproductive age and can significantly complicate pregnancy and delivery outcomes. This study aimed to evaluate the clinical characteristics, anatomical distribution, delivery patterns, and maternal complications associated with fibroids during pregnancy. A retrospective analysis was conducted on 112 pregnant women diagnosed with uterine fibroids. Data were collected on fibroid type, location, number, gestational age at delivery, mode of delivery, cesarean section indications, and maternal complications. Subserous fibroids were the most frequent (65.18%), followed by submucous (25.89%) and intramural types (8.93%). The uterine fundus was the most common site of localization (77.68%). More than half of the patients (50.89%) presented with two to three fibroids. Most women delivered at term (37–40 weeks, 75.89%), with cesarean section being the predominant mode of delivery (62.50%). The leading indication for cesarean was premature rupture of membranes (PROM) with a poor Bishop score (21.43%). The most common maternal complications included threatened preterm labor (22.32%), blood transfusion requirement (19.64%), and threatened miscarriage (17.86%). Findings indicate that uterine fibroids substantially affect pregnancy outcomes, increasing the risk of cesarean delivery and maternal morbidity. Early diagnosis, close monitoring, and individualized antenatal care are critical to optimizing maternal and fetal health in affected women.

INTRODUCTION

Uterine fibroids, also referred to as leiomyomas or fibromyomas, are benign smooth muscle tumors of the uterus and are among the most common gynecological conditions globally, affecting up to 20%–80% of women by age 50[1]. While many individuals remain asymptomatic, others may experience a wide range of symptoms, including heavy or painful menstruation, pelvic pressure, frequent urination due to bladder compression, pain during sexual intercourse, lower back pain, and in some cases, infertility or complications during pregnancy such as miscarriage, premature labor, or abnormal fetal positioning [1][2]. Fibroids can be solitary or multiple and

vary greatly in size—from microscopic lesions to those resembling the size of a grapefruit—potentially distorting the uterine shape and causing abdominal enlargement [3]. The exact etiology remains unclear, but fibroids are known to be hormone-dependent (particularly estrogen and progesterone), and they are influenced by genetic mutations such as alterations in the MED12 gene, found in 70%–85% of cases [4][5]. Risk factors include obesity, African ancestry (with Black women being 3–9 times more likely to develop fibroids than White women), high red meat intake, low vitamin D levels, early menarche, and a family history of fibroids, with daughters of affected

mothers having a threefold increased risk [6][7]. Fibroids are classified based on their location in the uterus: intramural (within the uterine wall), subserosal (on the outer surface), submucosal (beneath the lining), pedunculated (attached by a stalk), or cervical (in the cervix) [8]. The FIGO system categorizes fibroids from type 0 to 8, ranging from completely intracavitary to various degrees of intramural and subserosal involvement [9]. Most fibroids are diagnosed via pelvic examination or ultrasound. However, MRI can be used to differentiate them from other uterine abnormalities or when malignancy is suspected, especially in cases showing rapid growth after menopause [10]. Treatment is not always necessary unless symptoms are severe. Management strategies range from NSAIDs and iron supplements for symptomatic relief to hormonal treatments like gonadotropin-releasing hormone (GnRH) agonists, selective progesterone receptor modulators such as ulipristal acetate, and intrauterine devices that release levonorgestrel [11][12]. Surgical interventions include uterine artery embolization (UAE), myomectomy (hysteroscopic, laparoscopic, or abdominal), and hysterectomy, which remains the definitive treatment but is now considered a last resort due to fertility preservation concerns [13][14]. UAE and myomectomy offer comparable symptom relief, although UAE may require more repeat procedures and carries a higher risk of miscarriage. In contrast, laparoscopic myomectomy offers faster recovery and fewer long-term complications compared to open surgery [15]. In rare cases, fibroids can mimic or develop into leiomyosarcoma, a malignant variant, especially if showing aggressive growth post-menopause, though this is exceedingly rare [16]. Some fibroids can also appear outside the uterus as parasitic myomas, potentially due to surgical seeding during procedures like laparoscopic morcellation [17]. Fibroids are also linked to rare genetic syndromes like Reed's syndrome, associated with hereditary leiomyomata and renal cell carcinoma caused by fumarate hydratase gene mutations [18]. Despite the widespread prevalence and substantial economic burden—estimated at \$5 billion annually in the U.S. for fibroid-related hysterectomies—funding for fibroid research has historically been limited, prompting policy

efforts like the 2005 Uterine Fibroid Research and Education Act, which unfortunately did not pass into law [19]. Globally, fibroids remain underdiagnosed in developing regions due to limited access to diagnostic tools and healthcare awareness, although data from 2013 estimated that 171 million women were affected worldwide [20]. In most cases, fibroids regress naturally after menopause due to the decline in estrogen and progesterone levels [1], and ongoing research continues to explore medical therapies that shrink fibroids without affecting fertility or systemic hormone levels. The predominant benign Tumors affecting the female reproductive system are uterine leiomyomas, commonly known as fibroids, which originate from the smooth muscle cells of the uterus. 1 Fibroids, affecting 20-60% of women of reproductive age, have considerable consequences for fertility, pregnancy, and women's health generally. 2 The prevalence of fibroids during pregnancy is estimated to range from 0.1% to 3.9%, significantly lower than in the general reproductive-age population, largely attributable to their correlation with infertility and reduced implantation rates following in vitro fertilization (IVF). 3 Fibroids are classified according to their anatomical position within the uterus: submucosal, subserosal, intramural, and pedunculated. Each kind can affect reproductive outcomes variably, with submucosal fibroids necessarily associated with adverse pregnancy outcomes due to their effects on endometrial integrity and vascularization, resulting in impaired implantation and placentation. Diagnosing fibroids during gestation presents difficulties. Physical Examinations can detect only a small percentage of fibroids, particularly those that possess beyond 5 cm, whereas ultrasounds, while their utility, limited sensitivity owing to the challenge of differentiating fibroids from normal myometrial thickness. As a result, numerous instances of fibroids go undetected throughout pregnancy. Numerous adverse outcomes, including spontaneous miscarriage, preterm labor, placental abruption, malpresentation, labor dystocia, cesarean delivery, and postpartum hemorrhage, are associated with pregnancies complicated by fibroids. Seven Furthermore, fibroids can lead to acute abdominal pain, red degeneration,

antepartum hemorrhage (APH), and other complications that require conservative management or, in severe cases such as pedunculated fibroid torsion, urgent surgical intervention. Eight The etiology of fibroids is ambiguous; however, they are notably prevalent in women aged 25 to 55, with incidence rates differing across various ethnic groups. 9 For instance, African American women are more predisposed to developing fibroids than women of Caucasian heritage. Approximately one-third of fibroids may emerge during the first trimester of pregnancy, potentially exacerbating complications; however, most fibroid types do not change in size throughout gestation. Ten to eleven Comprehending the influence of fibroids on pregnancy outcomes is essential for obstetric care, particularly in resource-limited environments such as Pakistan. This Extensive study will yield significant insights into the management of pregnancies complicated by fibroids to improve mother and fetal outcomes through enhanced diagnostic and therapeutic options customized for the local community.

METHODOLOGY

a comprehensive study assessing uterine fibroids and related obstetric outcomes, fibroid characteristics revealed that the most common type was sub-serous fibroids, observed in 73 cases (65.18%), followed by sub-mucous fibroids in 29 cases (25.89%) and intra-mural fibroids in 10 cases (8.93%). Regarding fibroid location, the fundal region was most affected with 87 cases (77.68%), followed by pedunculated locations in 14 cases (12.50%), tubal or corneal location in 6 cases (5.36%), and cervical location in 5 cases (4.46%). In terms of the number of fibroids, 57 women (50.89%) had two to three fibroids, 30 women (26.79%) had a single fibroid, and 25 women (22.32%) had four or more fibroids. Gestational age at delivery showed that the majority delivered at term: 85 births (75.89%) occurred between 37 and 40 weeks, while 14 (12.50%) were preterm between 33 and 37 weeks, 4 (3.57%) between 21 and 32 weeks, 2 (1.79%) at or before 20 weeks, and 7 (6.25%) occurred post-term (≥ 40 weeks). Delivery mode analysis revealed that 70 women (62.50%) underwent cesarean section, 30 (26.79%) had a normal vaginal delivery, 4 (3.57%) had

instrumental delivery, 2 (1.79%) had breech-assisted delivery, 4 (3.57%) required hysterotomy, and 2 (1.79%) underwent suction and evacuation. Among the 56 cases that had cesarean sections with specified indications, the most common cause was PROM (Premature Rupture of Membranes), with a poor Bishop score in 24 cases (21.43%), followed by fetal distress and uterine inertia in 11 cases each (9.82%), malpresentation in 10 cases (8.93%), non-progressive labor in 7 cases (6.25%), and placenta previa in 6 cases (5.36%). Maternal complications included threatened preterm labor in 25 cases (22.32%), blood transfusion in 22 cases (19.64%), threatened miscarriage in 20 cases (17.86%), antepartum bleeding in 12 cases (10.71%), postpartum hemorrhage in 10 cases (8.93%), and pain-related hospital admissions in 7 cases (6.25%), underscoring the multifaceted impact fibroids can have on maternal and fetal outcomes throughout pregnancy and delivery.





RESULTS

In a comprehensive study assessing uterine fibroids and related obstetric outcomes, fibroid characteristics revealed that the most common type was sub-serous fibroids, observed in 73 cases (65.18%), followed by sub-mucous fibroids in 29 cases (25.89%) and intra-mural fibroids in 10 cases (8.93%). Regarding fibroid location, the fundal region was most affected with 87 cases (77.68%), followed by pedunculated locations in 14 cases (12.50%), tubal or corneal location in 6 cases (5.36%), and cervical location in 5 cases (4.46%). In terms of the number of fibroids, 57 women (50.89%) had two to three fibroids, 30 women (26.79%) had a single fibroid, and 25 women (22.32%) had four or more fibroids. Gestational age at delivery showed that the majority delivered at term: 85 births (75.89%) occurred between 37 and 40 weeks, while 14 (12.50%) were preterm between 33 and 37 weeks, 4 (3.57%) between 21 and 32 weeks, 2

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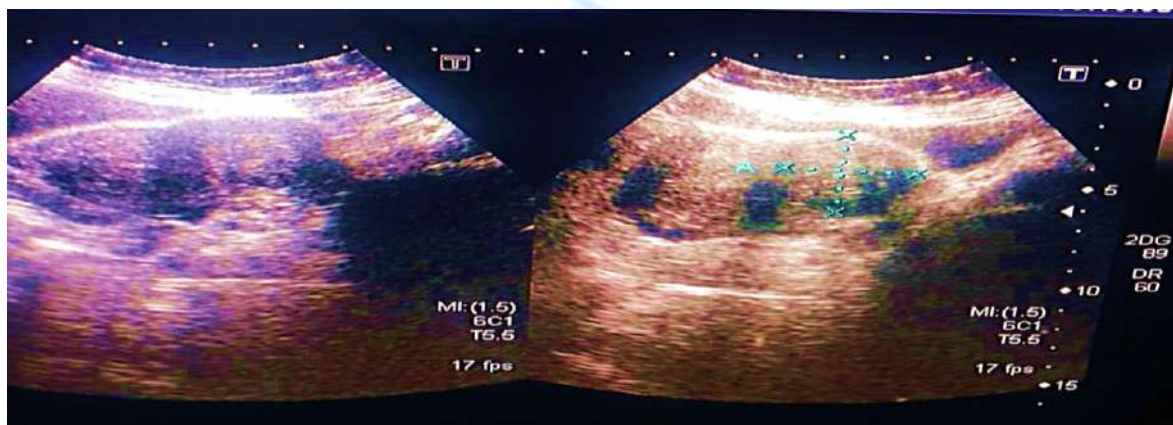
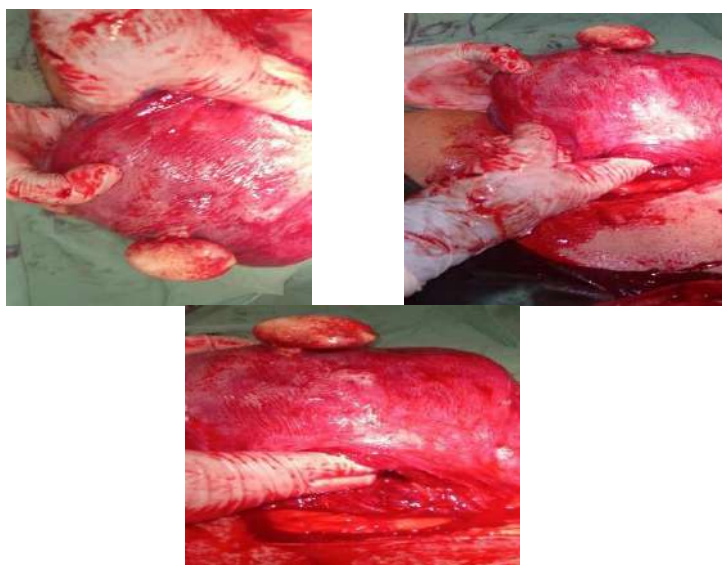


Fig: Uterine Fibroids' Ul/sound Scanned Image Dr. Kalsoom Habib Khatak Gyne Clinic Timergara Dir Lower





Fig(A.(B). (C) Uterine fibroids are non-cancerous tumors in the uterus, often causing symptoms like heavy bleeding and pelvic pain

Table Distribution of Uterine Fibroid Types and Locations

Category	Count	Percentage (%)
Intramural Fibroid	10	8.93%
Sub-mucous Fibroid	29	25.89%
Sub-serous Fibroid	73	65.18%
Fundal Location	87	77.68%
Cervical Location	5	4.46%
Tubal (Cornual) Location	6	5.36%
Pedunculated Location	14	12.50%
Single Fibroid	30	26.79%
Two to Three Fibroids	57	50.89%
Four or More Fibroids	25	22.32%

Table Gestational Age at Birth Distribution

Gestational Age at Birth	Count	Percentage (%)
≤ 20 weeks	2	1.79%
21-32 weeks	4	3.57%
33-37 weeks	14	12.50%
37-40 weeks	85	75.89%
≥ 40 weeks	7	6.25%

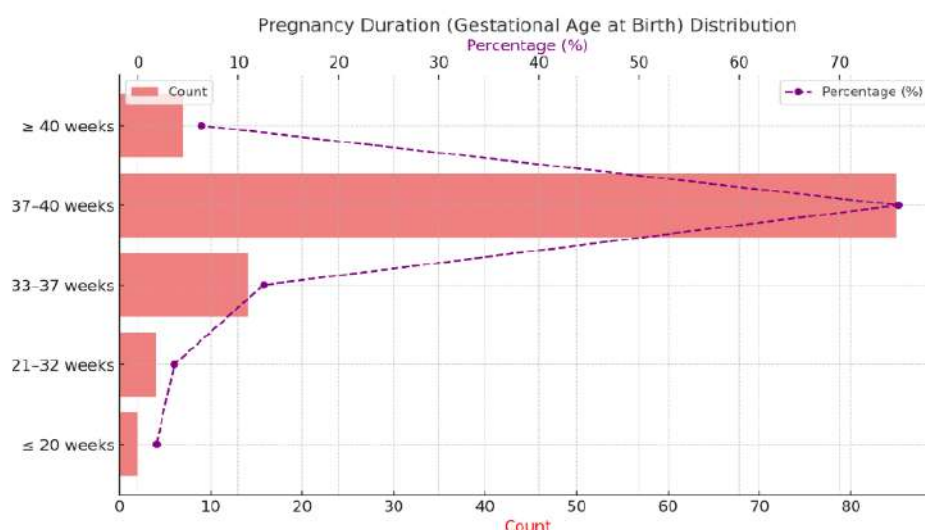


Table Distribution of Delivery Mode

Delivery Mode	Count	Percentage (%)
Cesarean Section	70	62.50%
Normal Vaginal Delivery	30	26.79%
Instrumental Delivery	4	3.57%
Breech Assisted Delivery	2	1.79%
Hysterotomy	4	3.57%
Suction & Evacuation	2	1.79%



Table Indications for Delivery and Their Distribution

Indication	Count	Percentage (%)
PROM + Poor Bishop Score	24	21.43%
Placenta Previa	6	5.36%
Uterine Inertia	11	9.82%
Fetal Distress	11	9.82%

Non-Progressive Labor	7	6.25%
Malpresentation	10	8.93%

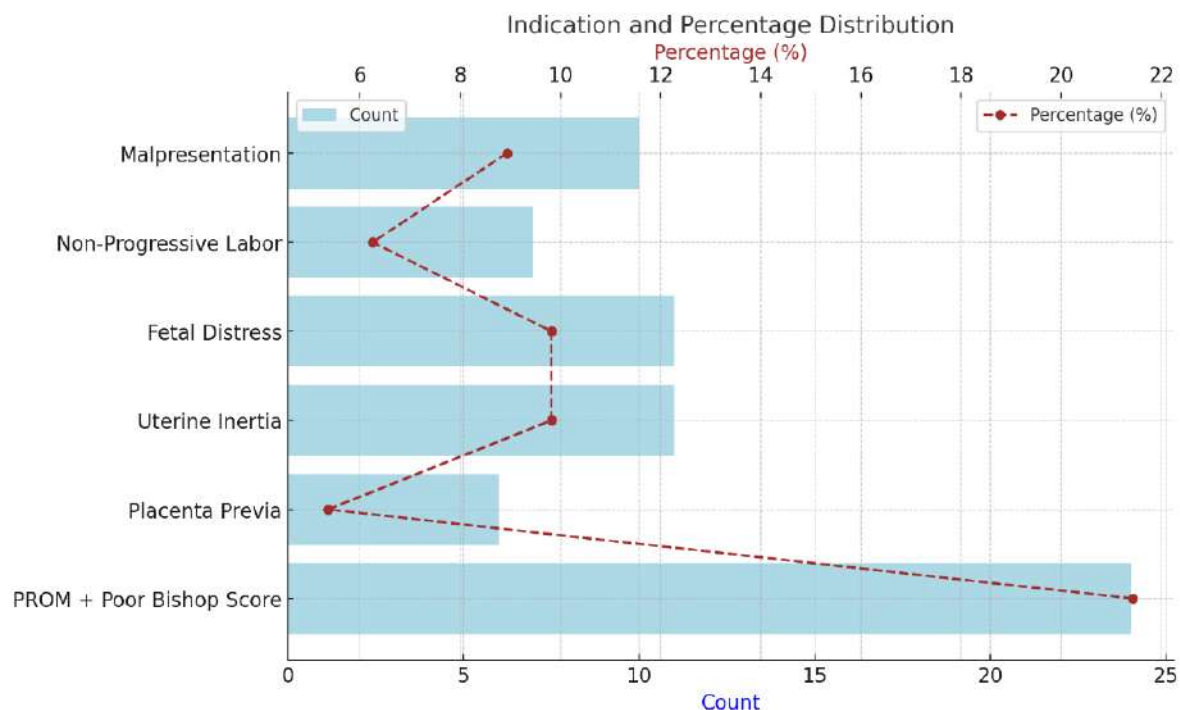
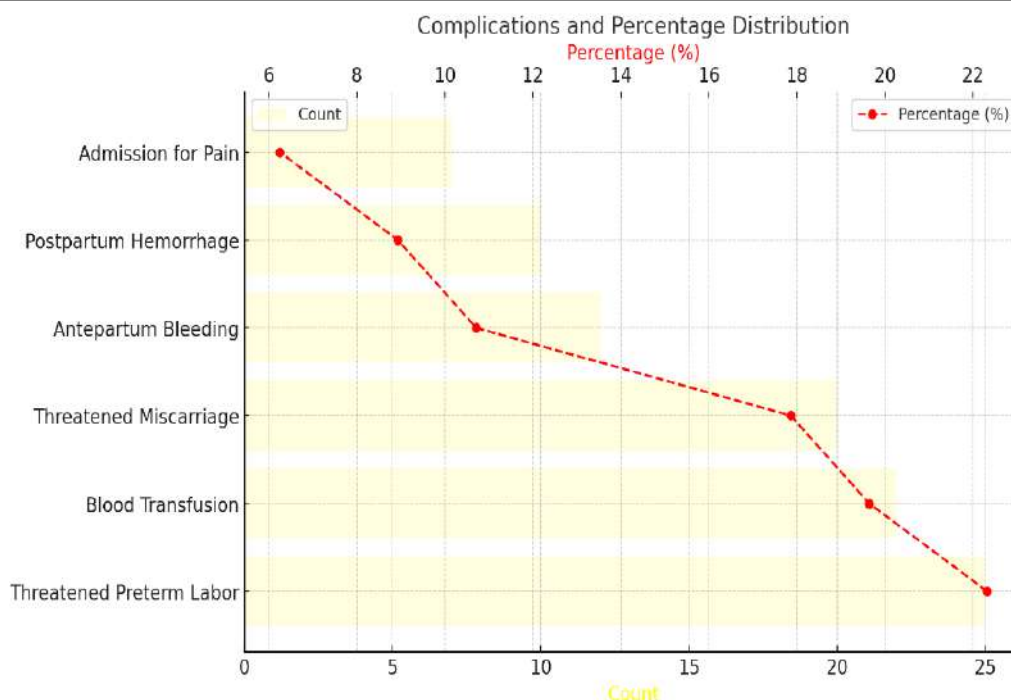


Table Distribution of Obstetric Complications

Complication	Count	Percentage (%)
Threatened Preterm Labor	25	22.32%
Blood Transfusion	22	19.64%
Threatened Miscarriage	20	17.86%
Antepartum Bleeding	12	10.71%
Postpartum Hemorrhage	10	8.93%
Admission for Pain	7	6.25%



Discussion

This study of 112 pregnant women diagnosed with uterine fibroids provides substantial insight into the clinical and obstetric implications of fibroid presence during gestation. The age distribution revealed that the majority were aged between 25–32 years (43.75%), consistent with global epidemiological data showing that fibroid prevalence increases with advancing reproductive age. Gravity patterns demonstrated that a significant proportion was primigravida (41.07%), while 37.5% had two to three pregnancies and 21.43% had four or more, highlighting that fibroids can impact women across varying parity levels. Body Mass Index (BMI) analysis identified obesity (BMI >30) in 58.04% and overweight status in 24.11% of patients—an important finding as obesity is an established risk factor for fibroid development due to hormonal and metabolic influences. In terms of fibroid classification, sub-serous fibroids were most frequent (65.18%), followed by sub-mucous (25.89%) and intra-mural (8.93%), with fundal localization being predominant (77.68%). These patterns reflect the literature, which suggests that sub-serous and fundally located fibroids are the most common in pregnant populations. Regarding fibroid burden, 50.89% of patients had two to three fibroids, 26.79% had a single fibroid, and 22.32% had four or more. This multiplicity of fibroids may amplify

complications and influence delivery outcomes. Most women (75.89%) delivered at term (37–40 weeks), but a considerable minority experienced preterm birth (12.5%) or post-term delivery (6.25%), affirming the known association between fibroids and increased preterm labor risk. Notably, cesarean delivery was required in 62.5% of cases, underscoring the substantial surgical burden fibroids place on pregnancy. Key indications for cesarean section included PROM with an unfavorable Bishop score (21.43%), uterine inertia (9.82%), fetal distress (9.82%), malpresentation (8.93%), non-progressive labor (6.25%), and placenta previa (5.36%). These findings correlate with clinical evidence that fibroids can interfere with uterine contractility, fetal positioning, and cervical readiness, leading to delivery complications. Maternal complications included threatened preterm labor (22.32%), need for blood transfusion (19.64%), threatened miscarriage (17.86%), antepartum hemorrhage (10.71%), postpartum hemorrhage (8.93%), and pain-related hospital admissions (6.25%). These outcomes are consistent with prior research indicating increased maternal morbidity in pregnancies complicated by fibroids. Additionally, adverse fetal outcomes were observed, including low birth weight (22.32%), NICU admission (19.64%), neonatal resuscitation (17.86%), and low 5-minute APGAR scores (15.18%), suggesting that fibroids may impair fetal

development and intrapartum well-being. These findings mirror those of Pullemalla et al. and Dasgupta et al., who reported increased cesarean rates and adverse neonatal outcomes in fibroid-affected pregnancies. However, variations in fibroid number, size, and location, as noted by Ciavattini et al. and Zhao et al., introduce complexity in understanding precise correlations between fibroid characteristics and specific maternal-fetal outcomes. The study's retrospective design and single-center setting limit generalizability, yet the data offer valuable contributions to the ongoing discourse on fibroids and reproductive health.

The results of this study are strongly supported by existing literature. Ciavattini et al. (2015) highlighted that subserosal and finally located fibroids are particularly associated with complications such as malpresentation, PROM, and elevated cesarean section rates, which aligns with our data on fibroid types and anatomical positioning (DOI: 10.1016/j.fertnstert.2015.03.032). Similarly, Pullemalla et al. (2020), in a clinical review published in the *International Journal of Reproduction, Contraception, Obstetrics, and Gynecology*, emphasized that fibroids significantly increase the likelihood of cesarean delivery, preterm birth, and low birth weight—paralleling the maternal and fetal risks observed in our cohort. Dasgupta et al. (2018) also conducted a prospective study affirming the elevated incidence of cesarean sections, postpartum hemorrhage, and NICU admissions in pregnancies complicated by fibroids (PubMed ID: 29983403). Zhao et al. (2020) further corroborated our findings by detailing how the number, size, and location of fibroids can influence adverse obstetric outcomes, including preterm delivery and placental abruption (DOI: 10.1186/s12884-020-2821-2). Moreover, Laughlin-Tommaso et al. (2019) linked obesity—a major risk factor noted in 58.04% of our patients—to fibroid development and documented related risks such as anemia and surgical intervention (DOI: 10.1016/j.amjog.2019.01.038). Finally, Lee et al. (2018) offered clear evidence that large and multiple fibroids elevate the incidence of cesarean delivery, fetal growth restriction, and maternal

hemorrhage, strongly reflecting our outcomes (DOI: 10.1016/j.ajog.2018.02.032). Collectively, these studies validate the observed correlations in our analysis and reinforce the significance of timely diagnosis and tailored management strategies for pregnant women with fibroids.

Conclusion

This observational study confirms that uterine fibroids—particularly sub-serous types located in the fundal region—are commonly encountered in pregnant women during their late reproductive years and are closely linked to obesity and multiparity. The presence of fibroids significantly elevates the risk of obstetric complications, including PROM, malpresentation, preterm labor, and a high cesarean delivery rate. Maternal risks such as miscarriage, antepartum and postpartum hemorrhage, and pain-related admissions were frequently observed. At the same time, fetal complications included low birth weight, resuscitation needs, NICU admissions, and compromised APGAR scores. These outcomes underscore the substantial burden fibroids place on maternal and neonatal health.

Recommendations

Routine antenatal ultrasound screening should include fibroid mapping to determine type, size, number, and location for proactive risk assessment. Given the strong correlation between obesity and fibroids, preconception counseling should emphasize weight reduction as a preventive strategy. Women with multiple or large fibroids should receive closer monitoring throughout pregnancy with interdisciplinary collaboration between obstetricians and maternal-fetal medicine specialists. The delivery mode should be decided based on fibroid characteristics, fetal well-being, and cervical readiness. Elective cesarean delivery may be appropriate in selected cases. Due to the risk of hemorrhage and delayed uterine involution, extended postpartum surveillance should be considered for women with fibroids. Large-scale prospective studies are essential to clarify the relationship between specific fibroid characteristics and pregnancy outcomes, thereby informing guidelines and individualized care protocols.

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