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ULTRASONOGRAPHIC EVALUATION OF FIGO CLASSIFICATION TO PREDICT ABORTION AND INFERTILITY IN MARRIED FEMALES

Original Research

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ABSTRACT

Background: Uterine fibroids, also referred to as leiomyomas, are the most common benign tumors of the female reproductive tract, affecting up to 70% of women by menopause. They often manifest during the reproductive years and may lead to heavy menstrual bleeding, pelvic pain, infertility, and adverse pregnancy outcomes. The International Federation of Gynecology and Obstetrics (FIGO) classification system provides a standardized approach to categorizing fibroids based on their anatomical location within the uterus, thereby improving diagnostic consistency, guiding treatment decisions, and enhancing patient outcomes.

Objective: The objective of this study was to evaluate uterine fibroids using the FIGO classification system and determine their predictive role in abortion and infertility among married women.

Methods: This cross-sectional analytical study was conducted at Bajwa Hospital and included 120 married females diagnosed with uterine fibroids. Participants were selected using non-probability convenient sampling. Women with endometriosis, leiomyosarcomas, prior hysterectomy, or those unwilling to provide informed consent were excluded. Clinical assessment and ultrasound were performed to document fibroid type, location, and FIGO classification. Data were analyzed using SPSS version 25, with descriptive and inferential statistics applied to evaluate distribution and associations.

Results: Among 120 participants, 34 (28.3%) had submucosal fibroids, 47 (39.2%) had intramural fibroids, and 39 (32.5%) had subserosal fibroids. Based on anatomical distribution, 3 (2.5%) were fundal, 57 (47.5%) anterior, 48 (40.0%) posterior, and 12 (10.0%) lateral. According to FIGO staging, the most frequent was stage 4 (32.5%), followed by stage 0 (23.3%) and stage 6 (21.7%). A history of abortion was reported in 56 women (46.7%), while 91 women (75.8%) reported pain, 33 (27.5%) reported menorrhagia, and 39 (32.5%) experienced oligomenorrhea. At the time of assessment, 12 women (10.0%) were pregnant.

Conclusion: The findings demonstrate that intramural fibroids, particularly those located in the anterior uterine wall, were the most prevalent and carried significant reproductive implications. Recognizing fibroid type and location through the FIGO classification system is essential for predicting abortion and infertility risk, enabling healthcare providers to tailor management strategies that improve both reproductive outcomes and overall quality of life.

Keywords: Abortion, Fertility, FIGO Classification, Infertility, Leiomyoma, Ultrasonography, Uterine Fibroids.

INTRODUCTION

Uterine fibroids, or leiomyomas, are the most common pelvic tumors among women, with nearly 80% affected by the age of 50 (1). While many fibroids remain asymptomatic, their presence can result in significant clinical consequences depending on size, number, and anatomical location. Manifestations include abnormal uterine bleeding, infertility, and recurrent pregnancy loss, highlighting their importance as a reproductive health concern (2). Despite their high prevalence, the exact etiology remains unclear, although age, family history, environmental influences, obesity, and vitamin D deficiency have been implicated as contributing factors (2,3). Epidemiological data show a striking racial disparity, with Black women experiencing a two- to three-fold higher prevalence than White women, a difference partly attributed to dietary fat sources and hormonal responsiveness to estradiol and progesterone (4). Fibroids are categorized by their uterine location, including intramural, submucosal, subserosal, and pedunculated types, with intramural fibroids being the most common. In cases where numerous fibroids are present, the condition is termed diffuse uterine leiomyomatosis (5). Their clinical relevance lies particularly in reproductive outcomes, as submucosal fibroids are strongly linked to infertility due to distortion of the endometrial cavity (6). Advanced imaging modalities such as three-dimensional ultrasound enhance the understanding of fibroid–endometrium relationships and have become indispensable for diagnosis, treatment planning, and classification (7). The International Federation of Gynecology and Obstetrics (FIGO) has introduced a standardized system for fibroid classification, which supports both accurate reporting and improved surgical planning (8).

Fibroids also carry implications for pregnancy, with reported prevalence among pregnant women ranging from 2% to 11%. They tend to grow more rapidly under the influence of increased estrogen, and larger fibroids are associated with complications such as miscarriage, malpresentation, intrauterine growth restriction, preterm labor, and postpartum hemorrhage (7,8). Surgical intervention, particularly myomectomy, may improve fertility outcomes by restoring uterine anatomy and function; however, surgical risks and recovery profiles differ between open and laparoscopic approaches, with the latter often preferred for its shorter recovery period despite comparable complication rates (8,9). Additional therapeutic insights highlight vitamin D supplementation as a potential low-cost, non-invasive management strategy due to its ability to inhibit fibroid growth (10). Meanwhile, obesity further complicates fibroid pathogenesis by disrupting hormonal regulation, although this link requires deeper exploration (11). Diagnostic evaluation through ultrasound reveals fibroids as well-defined hypoechoic or isoechoic masses with distinct vascular patterns, while Doppler and three-dimensional imaging provide critical details on vascularity and structural involvement (12). Beyond reproductive concerns, fibroids pose unique challenges in clinical contexts such as abortion care, where large fibroids may distort the uterine cavity and complicate surgical management, making medical abortion a safer alternative in early pregnancy (13). Despite extensive research, knowledge gaps persist regarding how specific fibroid characteristics reliably predict reproductive risks, particularly abortion and infertility outcomes. This research seeks to explore the association between uterine fibroids and adverse pregnancy outcomes, using the FIGO classification system to identify predictors of complications and clarify whether fibroid type and location can forecast reproductive risks. The overarching objective is to improve clinical decision-making and enhance reproductive outcomes for women with uterine fibroids.

METHODS

This cross-sectional analytical study was carried out at Bajwa Hospital and enrolled a total of 120 married females diagnosed with uterine fibroids. The study population was selected using predefined eligibility criteria to ensure uniformity and reliability of findings. Women were included if they were married, capable of providing informed consent, willing to participate in all scheduled study appointments, and diagnosed with symptomatic uterine fibroids. In addition, only women with secondary infertility were enrolled. Exclusion criteria comprised patients with endometriosis, histologically confirmed leiomyosarcomas, prior hysterectomy, refusal to provide written informed consent, and unmarried females. These criteria were applied to minimize confounding conditions and to focus specifically on the association between fibroids and infertility outcomes (2,3). Data collection involved structured case record forms in which demographic variables, clinical characteristics, and relevant reproductive history were documented. Diagnosis of fibroids was confirmed through ultrasound imaging performed by qualified radiologists, and the presence of symptoms was verified through clinical evaluation. Informed consent was obtained from all participants after explaining the study objectives, potential benefits, and risks. Ethical approval was sought from the institutional review board of the relevant institute. Data confidentiality was maintained throughout,

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and participation was voluntary. The collected data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were used to summarize baseline characteristics, while appropriate inferential tests were applied to examine associations, depending on the nature and distribution of the data. Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were presented as frequencies and percentages. Chi-square test and independent t-tests were applied where relevant, with a p-value of <0.05 considered statistically significant.

RESULTS

The study enrolled 120 married women diagnosed with uterine fibroids. A history of abortion was reported in 56 participants (46.7%), while 64 women (53.3%) did not have such a history. Pain was the most frequently reported symptom, affecting 91 patients (75.8%), whereas 29 women (24.2%) were asymptomatic in this regard. Menorrhagia was observed in 33 women (27.5%), while 87 women (72.5%) did not experience this symptom. Oligomenorrhea was present in 39 participants (32.5%), whereas 81 (67.5%) did not report menstrual irregularities of this type. At the time of data collection, 108 participants (90.0%) were not pregnant, while 12 (10.0%) were pregnant. Regarding diagnostic approaches, 116 women (96.7%) were examined using the transabdominal ultrasound method, while only 4 (3.3%) underwent transvaginal scanning. Fibroid location varied, with the majority detected in the anterior uterine wall in 57 cases (47.5%) and the posterior wall in 48 cases (40.0%). Fibroids were located in the lateral wall in 12 women (10.0%) and in the uterine fundus in 3 women (2.5%). In terms of classification, intramural fibroids were the most common type, observed in 47 women (39.2%), followed by subserosal fibroids in 39 women (32.5%) and submucosal fibroids in 34 women (28.3%). The distribution according to the International Federation of Gynecology and Obstetrics (FIGO) system ranged from stage 0 to stage 8. The most frequently observed category was stage 4, present in 39 patients (32.5%). Other stages included stage 0 in 28 women (23.3%), stage 6 in 26 (21.7%), stage 5 in 11 (9.2%), stage 1 and stage 7 in 6 women each (5.0%), and stage 3 and stage 8 in 2 women each (1.7%). The relationship between FIGO classification and history of abortion was examined, showing that women with both positive and negative abortion history were distributed across nearly all stages, with stage 4 consistently appearing as the most common.

Table 1: Clinical and Reproductive Characteristics of Women with Uterine Fibroids

Variable	Category	Frequency (n)	Percent (%)	Valid Percent (%)
History of Abortion	Negative	64	53.3	53.3
	Positive	56	46.7	46.7
	Total	120	100.0	100.0
Pain	Negative	29	24.2	24.2
	Positive	91	75.8	75.8
	Total	120	100.0	100.0
Menorrhagia	Negative	87	72.5	72.5
	Positive	33	27.5	27.5
	Total	120	100.0	100.0
Pregnancy	Negative	108	90.0	90.0
	Positive	12	10.0	10.0
	Total	120	100.0	100.0
Oligomenorrhea	Negative	81	67.5	67.5
	Positive	39	32.5	32.5
	Total	120	100.0	100.0

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Table 2: Distribution of Scanning Approaches Used for Diagnosis of Uterine Fibroids

Frequency			Percent	Valid Percent
Valid	TVS	4	3.3	3.3
	TAS	116	96.7	96.7
	Total	**120**	**100.0**	**100.0**

Table 3: Anatomical Location of Uterine Fibroids in Study Participants

Frequency			Percent	Valid Percent
Valid	fundal	3	2.5	2.5
	anterior	57	47.5	47.5
	posterior	48	40.0	40.0
	lateral	12	10.0	10.0
	Total	**120**	**100.0**	**100.0**

Table 4: Distribution of Uterine Fibroids by Type

Frequency			Percent	Valid Percent
Valid	submucosal	34	28.3	28.3
	intramural	47	39.2	39.2
	subserosal	39	32.5	32.5
	Total	**120**	**100.0**	**100.0**

Table 5: Distribution of Uterine Fibroids According to FIGO Classification

Frequency			Percent	Valid Percent
Valid	stage 0	28	23.3	23.3
	stage 1	6	5.0	5.0
	stage 3	2	1.7	1.7
	stage 4	39	32.5	32.5
	stage 5	11	9.2	9.2
	stage 6	26	21.7	21.7
	stage 7	6	5.0	5.0
	stage 8	2	1.7	1.7
	Total	**120**	**100.0**	**100.0**

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Table 6: Crosstabulation of History of Abortion with FIGO Classification of Uterine Fibroids

History of Abortion	Stage 0	Stage 1	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Total
Negative	16	3	2	20	8	11	3	1	64
Positive	12	3	0	19	3	15	3	1	56
Total	28	6	2	39	11	26	6	2	120

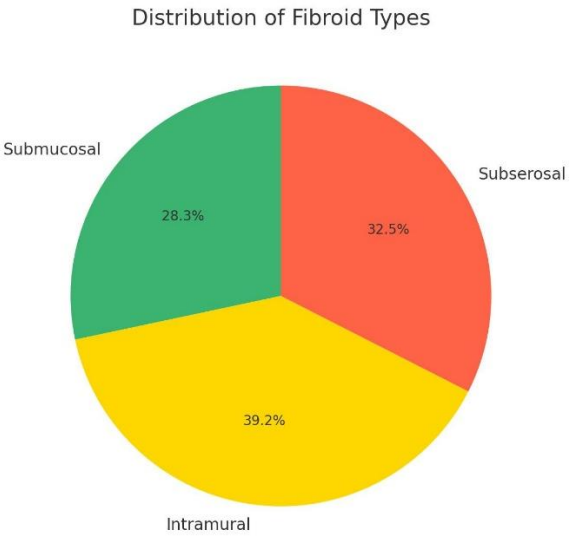

Figure 1 Distribution of Fibroid Types

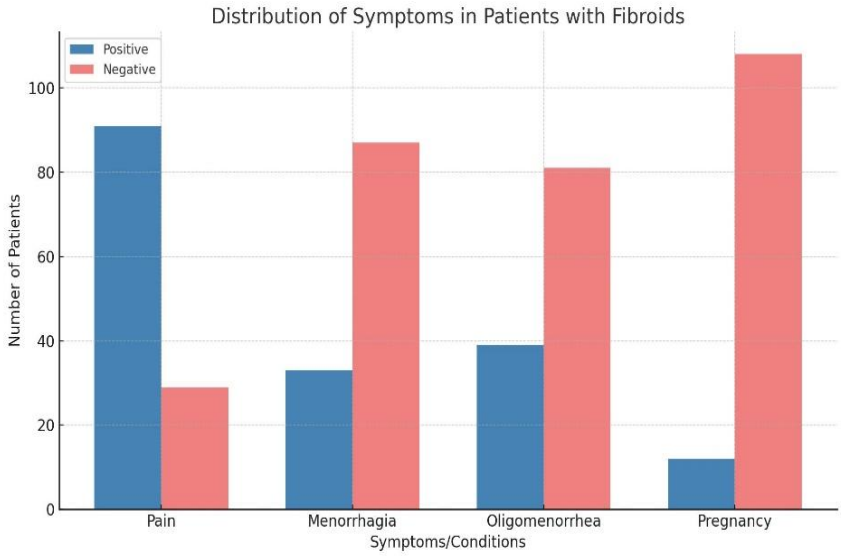

Figure 2 Distribution of Symptoms in Patients with Fibroids

DISCUSSION

The present study evaluated the role of the FIGO classification system in predicting abortion and infertility in women diagnosed with uterine fibroids. The findings demonstrated that FIGO staging was significantly associated with a history of abortion, supporting the view that fibroid characteristics, particularly their type and location, exert a critical influence on reproductive outcomes. This aligns with earlier research reporting that fibroids, especially those involving the uterine cavity, adversely affect fertility and increase the risk of miscarriage (14,15). While previous literature has frequently emphasized age as a key determinant in fibroid occurrence, particularly in women between 30 and 35 years, this study highlights the importance of anatomical distribution and classification in understanding reproductive risks. The analysis revealed that intramural fibroids were the most prevalent type, accounting for 39.2% of cases, followed by subserosal and submucosal fibroids (16). The dominance of intramural fibroids, particularly in the anterior and posterior uterine walls, explains their greater impact on reproductive outcomes, although submucosal fibroids remain the most detrimental due to their distortion of the endometrial cavity. Subserosal fibroids, in contrast, appeared less likely to interfere with fertility since they typically do not impinge upon the uterine cavity (17,18). These observations correspond with established evidence indicating that the effect of fibroids on conception and pregnancy outcomes is determined more by their anatomical location than by their mere presence. Clinical data also confirmed the high frequency of pain and menstrual disturbances, with 75.8% of women reporting pelvic pain and 27.5% experiencing menorrhagia (19). These symptoms, along with oligomenorrhea present in nearly one-third of participants, underscore the significant burden of fibroids on quality of life. Furthermore, the distribution of fibroids within the uterine walls, with anterior and posterior dominance, is consistent with previous literature that emphasizes the functional impairment caused by such positioning (20). The study findings reinforce that, submucosal fibroids should be prioritized for surgical management in infertility cases, as their removal has been associated with improved conception rates, whereas evidence remains limited regarding the benefits of removing intramural fibroids unless they significantly distort the cavity (21).

A notable strength of this study is the application of FIGO classification to establish correlations between fibroid type and reproductive outcomes. This approach provides a standardized method for assessing clinical risk and enhances the reproducibility of findings across

different populations. However, important limitations must be acknowledged. The study relied on a relatively small sample size and was conducted over a short duration, restricting the generalizability of the findings. The exclusion of women with primary infertility also limited the scope of conclusions regarding the full spectrum of fibroid-related reproductive complications. Furthermore, the use of non-probability sampling may have introduced selection bias. Despite these limitations, the study contributes to the growing body of evidence suggesting that fibroid characteristics, particularly those captured by FIGO staging, hold prognostic value in predicting adverse reproductive outcomes. Future research should aim to recruit larger sample sizes and adopt longitudinal study designs to better capture the dynamic nature of fibroid growth and its implications for fertility over time. Advanced imaging techniques could be incorporated to refine the assessment of fibroid size, number, and proximity to the endometrial lining, thereby enabling more precise risk stratification (22). In conclusion, the findings of this study strengthen the evidence that fibroid type and location, rather than mere presence, are key determinants of reproductive outcomes. Submucosal fibroids remain the most detrimental to fertility, while intramural fibroids show an intermediate effect, and subserosal fibroids are comparatively less impactful. By utilizing FIGO classification as a standardized framework, clinicians can make more informed decisions about patient management, particularly in cases of infertility. However, larger and longer-term studies remain necessary to clarify the role of intramural fibroids and to establish evidence-based guidelines for surgical intervention.

CONCLUSION

This study concludes that intramural fibroids, particularly those situated in the anterior uterine wall, were the most frequently observed and carried notable clinical relevance. The findings emphasize that both the type and location of fibroids play a pivotal role in determining symptom patterns and reproductive outcomes. Recognizing these characteristics is essential for healthcare providers, as it allows for more individualized treatment strategies aimed at relieving symptoms, reducing reproductive risks, and ultimately improving the quality of life for affected women. By highlighting the prognostic value of FIGO classification, this research underscores its importance in guiding clinical decision-making and supporting better reproductive health outcomes.

AUTHOR CONTRIBUTION

Author	Contribution
Noor Fatima*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muntaha Aamir	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Ayesha Mehmood	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muhammad Jawad Naeem Malik	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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