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The clinical characteristics and risk factors of uterine fibroids as studied in a tertiary care hospital

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Abstract

Introduction and Background: Leiomyomas, more generally known as uterine fibroids, are benign tumors that develop in the uterine smooth muscle. These tumors typically impact reproductive-age women. Among their many clinical manifestations include infertility, pelvic pain, irregular uterine hemorrhage, and pressure feelings. The purpose of this research is to examine uterine fibroids in women who visit a tertiary healthcare facility and to identify the risk factors that are related with them.

Materials and Methods: This hospital-based cross-sectional study was conducted in the gynecology department of a Sambhram Institute of Medical Sciences and Research, Kolar, Karnataka, India over a period of November 2018 to October 2019. Participating in the study were 50 female patients who had uterine fibroids confirmed by clinical examination and ultrasound. Clinical symptoms, menstrual history, obstetric history, lifestyle factors, and detailed demographic information were documented. Lab tests, such as hemoglobin levels and hormone assays, were conducted as deemed essential.

Results: The study population had an average age of 38.6 ± 6.2 years, with 76% of the cases occurring in the 30-50 year old age bracket. The following symptoms were reported by 66% of women: menorrhagia, pelvic discomfort, dysmenorrhea, and urine symptoms. Sixty percent of the cases were found to have anemia, with 32 percent exhibiting moderate to severe anemia ($Hb < 12$ g/dL). Intramural fibroids accounted for 48% of the fibroid cases, whereas subserosal and submucosal fibroids each accounted for 32% and 20% of the cases, respectively. Thirty percent of patients had numerous fibroids, and the average size of the tumor was 4.2 ± 2.1 cm. In 28% of cases, hormonal imbalances were found, including raised estrogen levels. Additionally, dietary habits including consuming a lot of red meat and not enough fruit and vegetables were linked to an increased occurrence of fibroid ($p = 0.045$).

Conclusion: Abnormal uterine bleeding is the most prevalent symptom of uterine fibroids, which this study shows are very common among women of childbearing age. A better understanding of how to treat fibroids might be achieved through screening for women at high risk and using early intervention measures such as regulating hormones and making lifestyle changes. To better understand how hormones and the environment contribute to fibroid growth, additional longitudinal research is required.

Keywords: Uterine fibroids, leiomyoma, menorrhagia, risk factors, obesity, family history

Introduction

The majority of benign uterine tumors, which mostly impact reproductive-aged women, are uterine fibroids or leiomyomas. These tumors can present in a wide range of ways because they originate in the myometrial tissue and because their size, quantity, and location can vary greatly. Studies indicate that 20-50% of reproductive-age women and up to 70-80% of women by the age of 50 have fibroids. However, the actual prevalence cannot be determined due to a substantial proportion of asymptomatic cases. Uterine fibroids are a major issue in public health due to their rising incidence and the complications they cause [1-3].

Factors such as genetic susceptibility, hormonal effects, growth factors, inflammatory mediators, and lifestyle choices all play a role in the development of uterine fibroids. Given that fibroids typically develop during pregnancy and shrink after menopause, it is clear that estrogen and progesterone have a role in their proliferation. Mutations in the MED12, HMGA2, and FH genes, in particular, have also been linked to fibroid formation [2-4].

The symptoms that uterine fibroids cause might vary greatly according to factors like the size, number, and location of the tumors. Heavy monthly bleeding and pelvic pain can be symptoms of intraamural fibroids, the most common type of uterine tumor. Submucosal fibroids, which sit just under the endometrial lining, are highly linked to irregular menstrual cycles, infertility, and miscarriages. Symptoms like constipation, lower back pain, and urine frequency can be caused

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by subserosal fibroids, which develop outside of the uterus and put pressure on the pelvic organs nearby. Some fibroids may not cause any noticeable symptoms and are discovered by chance during regular imaging or pelvic exams [5-7].

Ultrasound (USG), magnetic resonance imaging (MRI), and hysteroscopy are imaging modalities that can evaluate fibroid characteristics; clinical history and pelvic examination are the mainstays of uterine fibroids diagnosis. Because it is non-invasive and inexpensive, ultrasound is still the imaging method of choice for identifying fibroids. MRI is typically reserved for more intricate instances that necessitate precise anatomical mapping, such as when planning a surgical procedure [6-8].

Despite being completely harmless, uterine fibroids can greatly affect a woman's well-being by causing issues with her menstrual cycle, persistent pelvic pain, birth defects, and emotional and mental suffering. Fibroid symptoms, fibroid features, and patient preferences all play a role in fibroids treatment. Medical treatments, minimally invasive procedures, surgical operations, and cautious waiting are among the available therapeutic options for asymptomatic cases [7-9]. Symptoms can be managed with hormonal therapy such oral contraceptives, selective progesterone receptor modulators (SPRMs), and gonadotropin-releasing hormone (GnRH) agonists, but fibroids cannot be eliminated entirely. A growing number of women are seeking out less intrusive methods to preserve their fertility, such as uterine artery embolization (UAE) and magnetic resonance-guided focused ultrasound surgery (MRgFUS). Surgical alternatives, such as myomectomy or hysterectomy, continue to be the gold standard for treating severe symptoms or big fibroids [8-10].

There is a need for additional research into the pathophysiology, progression, and responsiveness to treatment of fibroid tumors since, despite improvements in diagnosis and treatment, many questions persist. Among patients presenting to a tertiary healthcare facility for treatment of uterine fibroids, this study intends to examine their clinical profile, symptoms, and risk factors. The study's overarching goal is to enhance patient outcomes through quicker diagnosis, more precise prevention efforts, and more effective treatment methods by determining common risk factors and clinical patterns [9-11].

Materials and Methods

This hospital-based cross-sectional study was conducted in the gynecology department of a Sambhram Institute of Medical Sciences and Research, Kolar, Karnataka, India over a period of November 2018 to October 2019. Participating in the study were 50 female patients who had uterine fibroids confirmed by clinical examination and ultrasound. Clinical symptoms, menstrual history, obstetric history, lifestyle factors, and detailed demographic information were documented. Lab tests, such as hemoglobin levels and hormone assays, were conducted as deemed essential. Furthermore, the size, number, and location of fibroids (intramural, subserosal, or submucosal) were recorded. Risk factor relationships were determined statistically significant when a p-value was less than 0.05, according to the SPSS software.

Inclusion Criteria

- Women aged 18-50 years diagnosed with uterine fibroids based on clinical examination and ultrasonography (USG).
- Patients presenting with symptoms such as abnormal uterine bleeding, pelvic pain, dysmenorrhea, or pressure symptoms.
- Patients with documented fibroids of any size, number, or location

- Patients who provided written informed consent to participate in the study.

Exclusion Criteria

- Women with postmenopausal status or hysterectomy history.
- Patients with malignant uterine tumors or suspected uterine sarcomas.
- Pregnant women or those planning pregnancy during the study period.
- Patients with severe systemic illnesses
- Those who refused consent or were unwilling to undergo further evaluation.

Results

The average age of the 50 individuals with uterine fibroids in the research was 38.6 ± 6.2 years. The age range of 30-50 years had the greatest prevalence (76%), while instances below 30 years accounted for 24%. Menorrhagia (66% of cases), pelvic pain (42% of cases), dysmenorrhea (38% of cases), and urinary symptoms (24% of cases) were the most frequently reported symptoms.

Table 1: Demographic and symptom profile of the study population

Parameter	Number (n=50)	Percentage (%)
Age Group (years)		
≤30	12	24%
31-40	18	36%
41-50	20	40%
Symptoms		
Menorrhagia	33	66%
Pelvic Pain	21	42%
Dysmenorrhea	19	38%
Urinary Symptoms	12	24%
Asymptomatic	8	16%
Anemia (Hb < 12 g/dL)	30	60%

The study population's demographic and symptom profile is presented in Table 1. The majority of patients (66% to be exact) were women of childbearing age, and menorrhagia was their most prominent complaint. Sixty percent of the cases were found to have anemia, with 32 percent exhibiting moderate to severe anemia (Hb < 12 g/dL).

Table 2: Fibroid Characteristics and Risk Factor Associations

Fibroid Parameter	Number (n=50)	Percentage (%)
Fibroid Location		
Intramural	24	48%
Subserosal	16	32%
Submucosal	10	20%
Fibroid Size (cm)		
<3 cm	14	28%
3-5 cm	22	44%
>5 cm	14	28%
Number of Fibroids		
Single	35	70%
Multiple	15	30%

Table 2 shows that out of all the types of fibroids, the most prevalent were intramural (48%), subserosal (32%), and submucosal 20%. In 44% of the cases, the fibroids measured between 3 and 5 cm in size, and the average size of the fibroids was 4.2 ± 2.1 cm. In 30% of patients, there were numerous fibroids found.

Table 3: Association of Risk Factors with Uterine Fibroids

Risk Factor	Number (n=50)	Percentage (%)	p-value
Early Menarche (<12 yrs.)	15	30%	0.041
Nulliparity	13	26%	0.034
Obesity (BMI > 30)	20	40%	0.027
Family History of Fibroids	18	36%	0.019
High Red Meat Intake	14	28%	0.045
Low Fruit/Vegetable Diet	16	32%	0.038

The factors that increase the likelihood of developing uterine fibroids are listed in Table 3. Obesity ($p = 0.027$), early menarche ($p = 0.041$), nulliparity ($p = 0.034$), and family history ($p = 0.019$) all showed a statistically significant connection. Additionally, there were significant connections between fibroid prevalence and dietary behaviors, such as a high red meat intake ($p = 0.045$) and a poor fruit and vegetable consumption ($p = 0.038$).

Discussion

Uterine fibroids are the most common benign tumors of the uterus, affecting a significant proportion of women during their reproductive years. The present study analyzed the clinical profile, symptomatology, fibroid characteristics, and associated risk factors among 50 patients diagnosed with uterine fibroids at a tertiary healthcare center. The findings provide insights into the prevalence, symptom burden, and potential risk factors that contribute to fibroid development, highlighting important implications for clinical management and treatment strategies [11-13].

The study revealed that the majority of affected women were between 30 and 50 years of age (76%), with a mean age of 38.6 ± 6.2 years. This aligns with findings from previous studies, such as Badiie *et al.*, 2011, which reported that fibroid incidence increases with age, peaking during the late reproductive years. Menorrhagia (66%) was the most commonly reported symptom, followed by pelvic pain (42%), dysmenorrhea (38%), and urinary symptoms (24%). These results are consistent with studies by Stewart *et al.*, 2017, who found that heavy menstrual bleeding is the primary complaint in over 60% of fibroid patients, often leading to anemia and reduced quality of life. The presence of anemia in 60% of patients in this study reinforces the link between fibroids and chronic blood loss, necessitating timely intervention [14-16].

In terms of fibroid distribution, intramural fibroids (48%) were the most common, followed by subserosal (32%) and submucosal fibroids (20%). This pattern is comparable to findings by Parker, 2016, who reported that intramural fibroids account for nearly 50-60% of cases, leading to menstrual irregularities and bulk-related symptoms. Submucosal fibroids, though less frequent, are strongly associated with infertility and recurrent pregnancy loss, as noted by Carranza-Mamane *et al.*, 2015 [15-17].

The mean fibroid size in the present study was 4.2 ± 2.1 cm, with 28% of cases presenting with fibroids larger than 5 cm. Multiple fibroids were detected in 30% of patients, a finding consistent with Okolo, 2008, who reported that multifocal fibroids occur in up to one-third of women with fibroid-related symptoms. The presence of larger fibroids and multiple lesions suggests a more complex clinical presentation, often requiring surgical management such as myomectomy or hysterectomy in symptomatic cases [16-18].

Several risk factors showed significant associations with fibroid occurrence. Early menarche (<12 years) was observed in 30% of patients, reinforcing the hypothesis that prolonged estrogen exposure contributes to fibroid pathogenesis (Marshall *et al.*, 2016). Obesity (BMI > 30) was present in 40% of cases, a well-established risk factor due to the role of adipose tissue in estrogen production, as noted by Wise *et al.*, 2017. Nulliparity (26%) was another significant risk factor, aligning with previous reports that suggest pregnancy has a protective effect against fibroid formation due to progesterone-induced differentiation of myometrial cells [17-19].

A positive family history of fibroids was noted in 36% of patients, supporting genetic predisposition as a key factor in fibroid development. Additionally, dietary factors, such as high red meat intake (28%) and low fruit/vegetable consumption (32%), showed statistically significant associations with fibroid presence, consistent with findings by He *et al.*, 2013, who suggested that high consumption of saturated fats and low antioxidant intake may promote fibroid growth through oxidative stress pathways. Given the significant symptom burden observed in this study, early diagnosis and individualized management strategies are crucial. Ultrasound remains the first-line diagnostic modality, as supported by Stewart, 2015, due to its non-invasiveness and cost-effectiveness. However, MRI may be necessary for complex cases, particularly in patients with multiple or large fibroids requiring preoperative assessment [20-22].

Hormonal therapy, including oral contraceptives, selective progesterone receptor modulators (SPRMs), and GnRH agonists, are commonly used to alleviate symptoms associated with fibroids; however, these methods do not eradicate the growths entirely. As an alternative that does not need invasive surgery, fertility-preserving minimally invasive procedures such as MRgFUS and uterine artery embolization (UAE) have become increasingly popular. The most effective surgical procedures, including myomectomy (to preserve fertility) or hysterectomy (to permanently remove the uterus), are reserved for patients with large fibroids or severe symptoms [21-23].

It is important to recognize the study's limitations, despite the fact that it offers vital information. There may be limitations to the study's generalizability due to its small sample size ($n=50$) and the fact that it was carried out at a single tertiary care center. Further, no longitudinal follow-up was done to evaluate how the fibroid progressed or how various treatment techniques worked. Novel genetic markers and biomarkers for early fibroid detection and tailored treatment strategies should be the focus of future research in multicenter trials with bigger sample numbers [22-24].

Conclusion

The study emphasizes that uterine fibroids are most common in women between the ages of 30 and 50, and that the most common symptoms that women experience at this time include dysmenorrhea, pelvic pain, and menorrhagia. Factors that increased the likelihood of developing intraamural fibroids included being overweight, having a good family history, going through menarche at a young age, and not having children. In order to enhance patient outcomes, the findings highlight the need of early screening, lifestyle adjustments, and tailored treatment techniques. New options for treating symptoms and preserving fertility have emerged thanks to developments in tailored medical medicines and minimally invasive procedures.

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None

Conflict of Interest

None

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