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Patterns and Characteristics of Uterine Fibroids among Women Attending a Tertiary Maternity Hospital in Sana'a City, Yemen

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ABSTRACT

Background: Uterine fibroids are the most common benign pelvic tumors in women of reproductive age and a major cause of gynecologic morbidity. While global and regional prevalence data exist, no published studies have described their patterns and characteristics in Yemen. Therefore, this study aimed to describe the demographic, reproductive, and clinical features of uterine fibroids among women attending a tertiary maternity hospital in Sana'a City, Yemen.

Methods: A descriptive cross-sectional study was conducted using retrospective data from January 1 to December 31, 2022, at Al-Sabeen Maternity Hospital in Sana'a. Medical records of 171 women diagnosed with uterine fibroids who underwent hysterectomy or myomectomy were reviewed. Data on demographic factors, reproductive history, fibroid characteristics, and surgical management were extracted and analyzed.

Results: Of the 171 women with uterine fibroids, most were aged >40 years (45%), followed by 30–40 years (35.7%), with 19.3% younger than 30 years. Menarche under the age of 12 years was reported by 52.6% of women, and most were multiparous (64.3%). A positive family history was uncommon (2.3%). More than half of women (54.4%) had a single fibroid, while 45.6% had multiple fibroids. Intramural fibroids predominated (81.3%), followed by subserosal (21.1%) and submucosal (17.5%) types, with broad ligament (4.7%) and cervical (1.8%) sites being rarely affected. Myomectomy was performed in 62.6% of cases and hysterectomy in 37.4%. Multiple and submucosal fibroids were more frequent in women with early menarche, whereas single and intramural fibroids were more common in those with later menarche. Multiple fibroids were more common in nulliparous women, whereas single fibroids predominated among multiparous women.

Conclusion: Uterine fibroids are most frequently found in women over 40 years of age, suggesting a potential association between advancing age and fibroid development. Early menarche and nulliparity are more commonly linked to multiple fibroids, particularly subserosal and submucosal types, whereas multiparous women more often present with single and intramural fibroids. These patterns indicate that both age at menarche and reproductive history may influence fibroid number and anatomical location. Recognizing these trends can enhance clinical assessment and guide more tailored, patient-centered management strategies.

Keywords: Uterine fibroids ▪ Parity ▪ Menarche ▪ Yemen

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1. Introduction

Uterine fibroids, also known as leiomyomata, are the most common pelvic tumors in women of reproductive age, excluding pregnancy-related masses.[1,2] These tumors are clinically diagnosed in approximately 30% of women during their reproductive age, representing a leading cause of gynecologic morbidity. Symptoms often involve pelvic pain, reproductive dysfunction, and excessive menstrual bleeding.[3, 4]

Clinically, uterine fibroids are diagnosed two to three times more frequently in Black women than in White women.[2,3] Black women are often diagnosed at a younger age and more typically exhibit multiple and symptomatic tumors.[3] Although the exact etiology of uterine fibroids remains unclear, their growth is thought to be influenced by ovarian hormones. Risk factors include an earlier age at menarche, higher parity, and age at first birth, while the risk increases with the number of years since the last term birth. The evidence regarding oral contraceptives is inconsistent, but an inverse association has been suggested, especially with higher-dose progestin preparations.[3]

Many uterine fibroids are asymptomatic and are often detected incidentally. To assess their size, position and morphology, transvaginal ultrasonography, magnetic resonance imaging, sonohysterography, and hysteroscopy can be used. Ultrasonography is generally the preferred initial diagnostic method because it is the least invasive and most cost-effective. Treatment options include hysterectomy, myomectomy, uterine artery embolization, myolysis, and medical therapy. Treatment plans should be customized, considering factors such as symptom severity, the patient's preference for definitive treatment, the desire to preserve fertility, the importance of retaining the uterus, infertility related to uterine cavity abnormalities, and any previous pregnancy complications associated with fibroids.[4,5]

Globally, the prevalence of uterine fibroids varies widely from 4.5% to 80%.[6,7] In the Middle East, a systematic review estimated a pooled prevalence of 30.6%, with rates exceeding 50% among hospital-based patients undergoing gynecological surgery or presenting with abnormal uterine bleeding.[8]

In Saudi Arabia, a prevalence of 9.9% was reported for uterine fibroids, with obesity, early menarche and positive family history identified as significant risk factors.[9] A case-control study confirmed the association of high body mass index (BMI) and age over 40 years with fibroids, while oral contraceptive use appeared protective.[10] It was found that 44.4% of Saudi patients with fibroids were obese, and 69% presented with abnormal uterine bleeding, highlighting the role of modifiable lifestyle factors.[10]

In Yemen, uterine fibroids are a recognized gynecologic problem, but published data are lacking. This study aimed to describe the pattern and characteristics of uterine fibroids among women seeking healthcare in a maternity hospital in Sana'a City, Yemen, over one year to provide preliminary insights into this health issue.

2. Methods

2.1. Study design, population and setting

A descriptive cross-sectional study using retrospective data was conducted in the Obstetrics and Gynecology Department of Al-Sabeen Maternity Hospital in Sana'a from January 1 to December 31, 2022. The study included the records of 171 women diagnosed with uterine fibroids and undergoing hysterectomy or myomectomy during the study period.

2.2. Data collection

Data were extracted from all women's medical records provided by the Department of Statistics at the study hospital using a structured form. These data included age, age at first menarche, family

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history of uterine fibroids, parity, characteristics of uterine fibroids, and type of management.

2.3. Data analysis

The data were analyzed using the IBM SPSS Statistics (IBM Corp., Armonk, NY, USA). Frequencies and percentages were used to describe data.

3. Results

3.1. Characteristics of women with uterine fibroids

Of the 171 women with uterine fibroids, most were older than 40 years (45%), followed by those aged from 30 to 40 years (35.7%) and younger than 30 years (19.3%). More than half of women (52.6%) experienced menarche before the age of 12 years. The majority were multiparous (64.3%), followed by nulliparous (28.7%) and primiparous (7.0%) women. A positive family history of uterine fibroids was uncommon, reported in only 2.3% of cases (Table 1).

Table 1: Characteristics of women with uterine fibroids attending Al-Sabeen Maternity Hospital in Sana'a City, Yemen (2022)*

Characteristics	*n*	(%)
Age (years)		
<30	33	**(19.3)**
30–40	61	**(35.7)**
>40	77	**(45.0)**
Age at menarche		
<12	90	**(52.6)**
≥12	81	**(47.4)**
Parity		
Nulliparous	49	**(28.7)**
Primiparous	12	**(7.0)**
Multiparous	110	**(64.3)**
Family history of uterine fibroids		
Yes	4	**(2.3)**
No	167	**(97.7)**

*The total number of women diagnosed with uterine fibroids was 171.

3.2. Characteristics of uterine fibroids

More than half of the women (54.4%) had a single fibroid, while 45.6% presented with multiple fibroids. Intramural fibroids were the most common type (81.3%), followed by subserosal (21.1%) and submucosal (17.5%) fibroids. However, the broad ligament (4.7%) and cervix (1.8%) were the least frequent sites. The majority of fibroids were managed by myomectomy (62.6%), whereas hysterectomy was carried out in 37.4% of cases (Table 2).

Table 2: Characteristics of uterine fibroids among women attending Al-Sabeen Maternity Hospital in Sana'a City, Yemen (2022)*

Uterine fibroid characteristics	*n*	(%)
Number of fibroids		
Single	93	**(54.4)**
Multiple	78	**(45.6)**
Fibroid site[a]		
Intramural	139	**(81.3)**
Subserosal	36	**(21.1)**
Submucosal	30	**(17.5)**
Broad ligament	8	**(4.7)**
Cervical	3	**(1.8)**
Surgical management		
Myomectomy	107	**(62.6)**
Hysterectomy	64	**(37.4)**

*The total number of women diagnosed with uterine fibroids was 171. [a] Some women had fibroids in multiple sites.

3.3. Distribution of uterine fibroids according to age at menarche

Among women with single fibroids, 95.7% reported menarche at ≥12 years, compared to 93.6% of those with multiple fibroids. Likewise, the majority of intramural (96.4%), subserosal (97.2%), submucosal (90.0%), and broad ligament (100%) fibroids were found in women with later menarche. In contrast, cervical fibroids had a relatively higher proportion (33.3%) among women who experienced menarche before the age of 12 years (Table 3).

3.4. Distribution of uterine fibroids according to parity

Single fibroids were most frequent among multiparous women (76.3%), followed by nulliparous (16.1%) and primiparous (7.5%) women. Conversely, multiple fibroids were more common among multiparous women (50%), followed by those nulliparous (43.6%), with only 6.4% of primiparous women having fibroids. Regarding fibroid sites, intramural fibroids predominated across all parity groups, being observed

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among 64% of multiparous women, followed by nulliparous (28.1%) and primiparous (7.9%) women. Subserosal and submucosal fibroids were more frequent in nulliparous women (58.3% and 53.3%, respectively) than in multiparous women (38.9% and 43.3%, respectively). Fibroids located in the broad ligament and cervix were relatively uncommon but were observed most often in multiparous women (75% and 66.7%, respectively).

Table 3: Distribution of uterine fibroids among women attending Al-Sabeen Maternity Hospital in Sana'a City, Yemen in 2022 by age at menarche

Fibroid characteristics	N	Age at menarche n (%)	
		<12 years	≥12 years
Number of fibroids			
Single	93	4 (**4.3**)	89 (**95.7**)
Multiple	78	5 (**6.4**)	73 (**93.6**)
Fibroid site			
Intramural	139	5 (**3.6**)	134 (**96.4**)
Subserosal	36	1 (**2.8**)	35 (**97.2**)
Submucosal	30	3 (**10.0**)	27 (**90.0**)
Broad ligament	8	0 (**0.0**)	8 (**100.0**)
Cervical	3	1 (**33.3**)	2 (**66.7**)

Table 4: Distribution of uterine fibroids among women attending Al-Sabeen Maternity Hospital in Sana'a City, Yemen (2022) by parity

Fibroid characteristics	N	Parity n (%)		
		Nulliparous	Primiparous	Multiparous
Number of fibroids				
Single	93	15 (**16.1**)	7 (**7.5**)	71 (**76.3**)
Multiple	78	34 (**43.6**)	5 (**6.4**)	39 (**50.0**)
Fibroid site				
Intramural	139	39 (**28.1**)	11 (**7.9**)	89 (**64.0**)
Subserosal	36	21 (**58.3**)	1 (**2.8**)	14 (**38.9**)
Submucosal	30	16 (**53.3**)	1 (**3.3**)	13 (**43.3**)
Broad ligament	8	2 (**25.0**)	0 (**0.0**)	6 (**75.0**)
Cervical	3	1 (**33.3**)	0 (**0.0**)	2 (**66.7**)

4. Discussion

To the best of our knowledge, this is the first study to report on uterine fibroids among women seeking healthcare in Sana'a. In the present study, most fibroids occurred in women older than 40 years, while those aged younger than 30 years were the least affected. This finding is consistent with that reported among Saudi women.[10] Notably, the incidence of uterine fibroid tumors increases with age, affecting more than 30% of women aged 40–60 years.[5] This age-related pattern may be attributed to the prolonged exposure to high levels of steroid hormones, particularly estrogen and progesterone, during this age period.

In the present study, only 4 of the 171 women (2.3%) reported a positive family history of uterine fibroids. Although this low proportion may suggest that family history is not a major risk factor, it is possible that many participants were unaware of fibroid diagnoses in their relatives. In contrast, a maternal history of leiomyomas has been found as a risk factor for developing uterine fibroids.[11]

The predominance of fibroids among multiparous women in this cohort contrasts with reports suggesting higher risk among nulliparous women,[12] possibly due to prolonged estrogen exposure without pregnancy. Parazzini et al.[13] found that parous women had a lower risk of fibroids compared to nulliparae, with risk decreasing as the number of births increased. Our finding also contrasts with those reported elsewhere.[14,15]

In the present study, more than half of the women reported experiencing menarche before the age of 12 years. This finding is consistent with previous research identifying early menarche as an established risk factor for uterine fibroids. In one study, onset of menarche at or before 11 years of age was associated with a 25% higher risk of developing fibroids compared to those whose menarche occurred at ages 12 or 13.[16]

The present study found that more than half of women (54.4%) had a single fibroid. This finding contrasts with a study conducted in the United States,[17] which reported that about 26% of women had multiple fibroids. On the other hand, our study found that the majority of fibroids were intramural (81.3%), followed by subserosal (21.1%) and

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submucosal (17.5%) fibroids. This pattern is consistent with findings by Akinyemi et al.,[18] who reported fibroid site frequencies of 70% intramural, 20% subserosal, and 10% submucosal. These findings support the understanding that fibroids typically begin intramurally before migrating outward or inward, depending on their type.

The present study found that women who experienced early menarche were more likely to present with multiple and submucosal fibroids, whereas those with later menarche more commonly had single and intramural fibroids. This pattern supports findings elsewhere, which linked early menarche to increased fibroid risk.[4] On the other hand, this study found that multiple fibroids were more frequently observed in nulliparous women, whereas single fibroids predominated among those with higher parity. Intramural fibroids were the most common type across all parity groups. Subserosal and submucosal fibroids occurred more often in nulliparous women, a pattern that may be influenced by hormonal differences, altered uterine vascular dynamics, or structural factors associated with the absence of pregnancy. These findings are consistent with a study among Ghanaian women, which reported a higher prevalence of multiple and symptomatic fibroids in women with no prior childbirth history.[15] This finding reinforces the hypothesis that parity may exert a protective effect against the development or multiplicity of fibroids, possibly through postpartum uterine remodeling and extended periods of hypoestrogenism during pregnancy and lactation.[19] Prospective studies are needed to examine additional risk factors for fibroids, including body weight, oral contraceptive use, hypertension, and smoking.

This study has several limitations that should be considered when interpreting the findings. The retrospective design relied on medical record review, which may have been affected by incomplete or inconsistent documentation, potentially leading to information bias. The study was also conducted in a single tertiary maternity hospital, which may limit the generalizability of the results to other regions or to women who do not seek care at tertiary facilities. In addition, important potential risk factors such as body mass index, lifestyle factors, and the use of hormonal contraception were not available in the records and could not be analyzed. Finally, the study population consisted only of women who underwent surgical intervention, making the findings not fully representative of the characteristics of uterine fibroids among women managed conservatively or those with asymptomatic fibroids.

5. Conclusion

Uterine fibroids are more frequently observed among women older than 40 years, indicating a possible link between advancing age and fibroid occurrence. Early onset of menarche and the absence of childbirth are more frequently found in cases with multiple fibroids, particularly subserosal and submucosal types. On the other hand, women with a history of multiparity more often present with single and intramural fibroids. These findings suggest that reproductive history and age at menarche may influence fibroid number and location. Myomectomy is the primary surgical approach, with hysterectomy used less often, reflecting a tendency toward fertility preservation. These findings highlight the need for targeted prevention, early detection, and management strategies tailored to the local context. Understanding these trends can support better clinical assessment and personalized management strategies for affected women.

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Ethical approval and consent

This study was approved by the Research Ethics Committee of the Faculty of Medicine and Health Sciences, University of Science and Technology in Sana'a, Yemen (Ethical Clerance No.: 1447/0061/UREC/UST). Informed consent was waived because of the retrospective nature of the study. Anonymity of data was maintained.

Conflict of Interest

The authors declare no conflict of interest associated with this article.

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