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Detection of Uterine Fibroids Through Ultrasound Among Women of Reproductive Age Presenting with Abnormal Uterine Bleeding in A Tertiary Care Hospital

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ABSTRACT

Fibroids are the leading cause of abnormal uterine bleeding (AUB). **Objective:** To detect uterine fibroids through ultrasound among women of reproductive age presenting with abnormal uterine bleeding in a tertiary care hospital. **Methods:** This descriptive cross-sectional study was conducted at the Diagnostic Center of Combined Military Hospital (CMH) Lahore. Data were collected from 200 women of reproductive age (15–49 years) with AUB. Women with adenomyosis, endometrial polyps, endometriosis and other gynecological problems were excluded. A consecutive non-probability sampling method was employed, and data were analyzed using IBM SPSS version 26.0. The chi-square test was applied for the comparison of categories. **Results:** The Average age of participants was 29.50 ± 8.32 years. From the participants with fibroids, common symptoms included pelvic pain (47%), back pain (46%), frequent urination (39%), and painful bleeding (68%). Out of the total, 53.5% had bleeding from other causes, and 46.50% had fibroids. Out of all participants, 46% had one fibroid, 0.5% had multiple fibroids, and 53.5% had none at all. There were 21.5% posterior wall fibroids and 25% anterior wall fibroids. Of the fibroids, 39.5% were hyperechoic and 7% were hypoechoic. The majority of fibroids 37.5% did not cause any distortion of the endometrial cavity. The endometrial thickness was normal in 84% of patients and increased in 32%. **Conclusions:** It was concluded that uterine fibroids were a common cause of AUB in women of reproductive age, with a significant proportion of cases presenting with symptoms such as pelvic pain, painful bleeding and frequent urination.

INTRODUCTION

Uterine fibroids are common, non-cancerous growths in the uterus. While some forms may show characteristics similar to malignant tumors, they are generally classified as benign [1]. When fibroids are suspected, the first diagnostic tool used is usually ultrasonography (USG). This method has a high sensitivity for detecting these tumors and can be performed either by transvaginal (TVS) or transabdominal (TAS) scanning [2]. The different types of fibroids based on their location include: 1. Intramural fibroids, growing within the uterine wall, distorting the cavity or outer surface, 2. Submucosal fibroids, arising just beneath the uterine lining, protruding into the uterus, 3.

Subserosal fibroids develop from the outer layer of the uterus, and cervical fibroids, which are located in the cervix rather than the main body of the uterus [3]. Fibroids result in heavy menstrual bleeding and painful periods can also cause pelvic pain not related to menstruation, bloating, frequent urination, and digestive disturbances [4]. Hormonal contraceptives and NSAIDs are among the treatment options for fibroids. Surgical options include hysterectomy, myomectomy, or uterine artery embolization [5]. Women of reproductive age make up 75% of this population with uterine fibroids, translating to millions around the globe [6]. Abnormal uterine bleeding

describes irregularities in timing, volume, frequency, and consistency regarding uterine origin; it is any deviation from normal patterns of menstrual bleeding [7]. Menstrual flow is determined by factors involving vascular tone, hemostatic function, and uterine contractions. Normal menstrual bleeding occurs within 4.5 to 8 days and 24 to 38 days concerning cycles and amounts to blood loss of 5 to 80 milliliters per cycle. The research definition for heavy menstrual bleeding is blood loss over 80 milliliters per cycle; a specific amount that may be tolerated before dangerous iron deficiency anemia occurs due HMB [8]. Medical treatments for AUB include NSAIDs, anti-fibrinolytics, and birth control pills. Surgical options include myomectomy, uterine fibroid embolization, hysterectomy, and endometrial ablation [9]. HMB is considered a type of AUB and is a serious clinical concern that impacts a sizable portion of women who are of reproductive age. The exact relationship between AUB and fibroids remains unclear, although fibroids are frequently found in women who experience AUB [10]. Previous research had predominantly concentrated on exploring the etiologies, diagnostic approaches, and therapeutic interventions for abnormal uterine bleeding (AUB) and uterine fibroids. The current study, however, aimed to explore the connection between AUB (Abnormal Uterine Bleeding) and uterine fibroids, with a focus on detailed patient clinical presentations and comprehensive ultrasound findings of fibroids, seeking to better understand the relationship between these two conditions.

This study aims to detect uterine fibroids through ultrasound among women of reproductive age presenting with abnormal uterine bleeding in a tertiary care hospital.

METHODS

This descriptive cross-sectional study was conducted at the Diagnostic Center of CMH Lahore between September and December 2024. Data were collected from 200 women of reproductive age (15–49 years) [11] presenting with AUB. The sample size was calculated through the WHO Geneva Calculator. The prevalence of fibroids was found to be 45.63% in 103 patients [12]. The following Cochran formula was used to calculate the sample size [13]. $n = z_{1-a}^2 P(1-P)/d^2$. Z-value=1.96 at 95% confidence level (α), anticipated population proportion (P)=0.4563, absolute precision required (d) = 0.07 and sample size (n) = 195. But data were collected from 200 patients who were selected through a non-probability consecutive sampling technique. Women of reproductive age (15–49 years) who presented with abnormal uterine bleeding and were non-pregnant were included in the study [11]. However, women with gynecological conditions such as adenomyosis, endometrial polyps, and endometriosis were excluded.

Ultrasound machine, Toshiba Xario with curvilinear transducer of 3-5 MHz frequency was used to carried out this research. The study was conducted at the diagnostic center of the Combined Military Hospital after ethical approval. Patients meeting the inclusion and exclusion criteria were enrolled and assessed for associated symptoms such as back pain, pelvic pain, frequent urination, and painful bleeding. Ultrasound imaging was performed using a curvilinear transducer (3-5 MHz) in the supine position, with transverse and sagittal planes used for evaluation. Key parameters recorded included the presence, number, location, and echogenicity of fibroids, as well as endometrial thickness and cavity distortion. Data were collected using a structured proforma and ultrasound reports. Written and verbal consent was taken from eligible participants. All information and data collection were kept confidential. Participants remained anonymous throughout the study. This study was conducted in line with ethical standards set by the ethical committee of CMH LMC and the Institute of Dentistry (IOD) (Ref Case#79/ERC/CMH/LMC. The terms of the Declaration of Helsinki were followed in the conduct of this investigation. Data analysis was done with IBM SPSS version 26.0. Descriptive statistics included frequencies, percentages, mean, and standard deviation, while inferential analysis was conducted using the Chi-square test to compare the frequencies. A p-value≤0.05 was considered statistically significant.

RESULTS

The current study included 200 women of reproductive age presenting with abnormal uterine bleeding and aimed to determine the prevalence of fibroids detected through ultrasound, which are presented in table 1.

Table 1: Demographic Characteristics of Study Population (n=200)

Characteristics	Categories	n (%)
Age Groups of Participants (Years)	15–19	24 (12%)
	20–24	40 (20%)
	25–29	49 (24.50%)
	30–34	28 (14%)
	35–39	30 (15%)
	40–44	18 (9%)
	45–49	11 (5.50%)
Age of Patients (Years), Mean ± SD	29.50 ± 8.332	
Marital Status of Patients	Unmarried	78 (39%)
	Married	122 (61%)

12% lied in the 15-19 years' age group, 20% lied in the 20-24 years' age group, 24.5% lied in the 25-29 years age group, 14% lied in the 30-34 years age group, 15% lied in the 35-39 years age group, 9% lied in the 40-44 years age group, and 5.5% lied in the 45-49 years age group. The mean ± SD of the study participants were 29.50 ± 8.32 years. Additionally, it

showed that of the 200 patients, 61% were married and 39% were unmarried. The demographic information of the study population, which included women of reproductive age (15–49 years), is shown in table 2.

Table 2: Frequency of Fibroids in Patients Diagnosed On Ultrasound

Variables	Present	Absent
	n (%)	
Fibroids	93 (46.50%)	107 (53.5%)
Total	200 (100%)	

68% of patients reported painful bleeding, 47% pelvic pain, 46% back pain, and 39% frequent urination. The clinical presentation of patients with fibroids was depicted in figure 1.
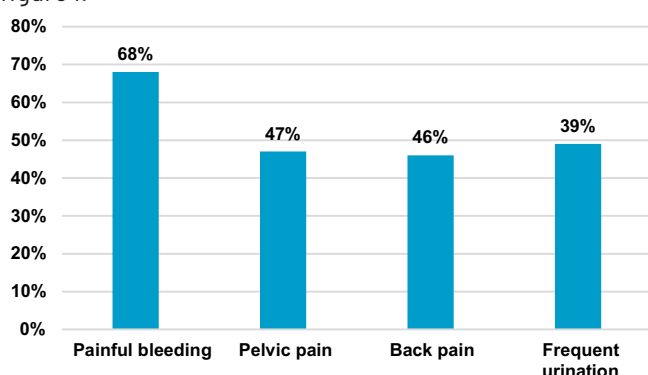

Figure 1: Frequency Distribution of Clinical Presentation of Patients with Fibroids

Out of the 200 patients, 46.5% had fibroids, while the remaining 53.5% had other reasons for their abnormal bleeding. 53.5% of cases had no fibroids, 46% had single fibroids, and only 0.5% had multiple fibroids. Of the fibroids that were found, 21.5% were on the posterior wall and 25% were on the anterior wall. Furthermore, 39.5% of the fibroids were hyperechoic and 7% were hypoechoic. 37.5% of fibroids did not result in any distortion of the endometrial cavity, while only 9% did. 32% of patients had increased endometrial thickness, whereas 84% of patients had normal endometrial thickness. Ultrasound results are shown in table 3.

Table 3: Ultrasound Findings in Patients with Abnormal Uterine Bleeding

Ultrasound Findings	Variables	n (%)
Number of Fibroids	Not Found	107 (53.5%)
	Single	92 (46%)
	Multiple	1 (0.5%)
Location of Fibroids	Not Applicable	107 (53.5%)
	Anterior Wall	50 (25%)
	Posterior Wall	43 (21.5%)
Echogenicity	Not Applicable	107 (53.5%)
	Hypoechoic	14 (7%)
	Hyperechoic	79 (39.5%)

	Not applicable	107 (53.5%)
Distortion of the Endometrial Cavity	Yes	18 (9%)
	No	75 (37.5%)
Endometrium Thickness	Increase	32 (16%)
	Normal	168 (84%)
Total		200 (100%)

Out of those who did not experience painful bleeding, 24 (25.8%) had fibroids and 40 (37.4%) did not. Of those who experienced excruciating bleeding, 69 (74.2%) had fibroids and 67 (62.6%) did not. 3.064 is the Chi-Square value, and 0.080 is the p-value. The correlation between the fibroids and painful bleeding is displayed in Table 4.

Table 4: Association Between Painful Bleeding and the Presence of Fibroids

Painful Bleeding	Fibroids Absent	Fibroids Present	Total	Chi-Square Value	p-Value
	n (%)				
No	40 (37.4%)	24 (25.8%)	64 (32%)		
Yes	67 (62.6%)	69 (74.2%)	136 (68%)	3.064	0.08
Total	107 (100%)	93 (100%)	200 (100%)		

Out of those who did not experience pelvic pain, 44 (47.3%) had fibroids and 62 (57.9%) did not. Of those who experienced pelvic pain, 49 (52.7%) had fibroids, while 45 (42.1%) did not. 2.258 was the Chi-Square value, and 0.133 was the p-value. The correlation between pelvic pain and fibroids is displayed in table 5.

Table 5: Association Between Pelvic Pain and the Presence of Fibroids

Pelvic Pain	Fibroids Absent	Fibroids Present	Total	Chi-Square Value	p-Value
	n (%)				
No	62 (57.9%)	44 (47.3%)	106 (53%)		
Yes	45 (42.1%)	49 (52.7%)	94 (47%)	2.258	0.133
Total	107 (100%)	93 (100%)	200 (100%)		

DISCUSSION

Uterine fibroids are one of the main causes of abnormal uterine bleeding, a common symptom which usually results from underlying problems [14-16]. Because fibroids frequently result in abundant, irregular or unusual bleeding patterns, there is a significant relationship between abnormal uterine bleeding and fibroids. When a patient present with AUB, ultrasound is a useful diagnostic method for diagnosing fibroids [17, 18]. Hanan *et al.,* study examined uterine fibroid prevalence in young females using FMH radiology data. Of 55 patients, 43 (78.18%) had fibroids, characterized by prolonged heavy bleeding and severe pelvic pain, while 12 (21.81%) showed no signs. Fibroids were more common in those with irregular, prolonged menstrual flow. In the current study of 200 patients with abnormal uterine bleeding, 46.5% had fibroids, while 53.5% had other causes. It also found that 68% of fibroid patients had painful bleeding, 47% pelvic pain, 46% back pain, and 39% frequent urination. Unlike Hanan *et al.*'s study, which

focused on young females with pelvic pain and heavy bleeding, this study included a larger sample and additional symptoms. Both studies confirmed the strong link between fibroids and abnormal bleeding, especially heavy menstrual flow [9]. Menorrhagia was the most common symptom, affecting 54.2% of participants in the study. The next most common symptoms were infertility, dysmenorrhea, metrorrhagia, and abdominal pain. Most fibroids were intramural, with the fundo-anterior region being the most common site. Similarly, in the current study of 200 women with abnormal uterine bleeding, 46.5% had fibroids. The most common symptoms were painful bleeding (68%), pelvic pain (47%), back pain (46%), and frequent urination (39%). While both studies identified abnormal uterine bleeding as the most prevalent symptom, the current study revealed a broader range of symptoms, including pelvic and back pain. It also found single fibroids (46%) primarily in the anterior and posterior walls, with the largest fibroids in these regions. While Samanta *et al.,* focused on the fundo-anterior position and fibroid size, the current study provided more detailed ultrasound findings, detecting both single and multiple fibroids and their potential to distort the endometrial cavity. Both studies highlighted the impact of fibroids on quality of life, particularly due to abnormal uterine bleeding [19, 20].

CONCLUSIONS

It was concluded that the current study was about the detection of uterine fibroids through ultrasound among women of reproductive age presenting with abnormal uterine bleeding. It found that nearly half of the population had fibroids. This study highlighted the significance of ultrasound as the first diagnostic tool and provided insightful information about the characteristics and symptoms of fibroids.

Authors Contribution

Conceptualization: YK, SS
Methodology: AR[1], KTK, ZS, AR[2]
Formal analysis: AR[2]
Writing review and editing: ZS, AA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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