



## Original Article



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

Areeba Rizwan<sup>1</sup>, Khadija Tul Kubra<sup>1</sup>, Zobia Saleem<sup>2</sup>, Asim Raza<sup>2</sup>, Yasser Khan<sup>2\*</sup>, Sidra Saleem<sup>1</sup> and Adeeba Anwaar<sup>1</sup><sup>1</sup>School of Allied Health Sciences, Combined Military Hospital, Lahore Medical College and Institute of Dentistry, Lahore, Pakistan<sup>2</sup>School of Allied Health Sciences, Combined Military Hospital, National University of Medical Sciences, Rawalpindi, Pakistan

## ARTICLE INFO

**Keywords:**

Abnormal Uterine Bleeding, Fibroids, Heavy Menstrual Bleeding, Reproductive Age

**How to Cite:**Rizwan, A., Kubra, K. T., Saleem, Z., Raza, A., Khan, Y., Saleem, S., & Anwar, A. (2025). Detection of Uterine Fibroids Through Ultrasound Among Women of Reproductive Age Presenting with Abnormal Uterine Bleeding in A Tertiary Care Hospital: Uterine Fibroids Among Women of Reproductive Age Presenting with AUB. *Pakistan BioMedical Journal*, 8(4), 17-21. <https://doi.org/10.54393/pbmj.v8i4.1226>**\*Corresponding Author:**

Yasser Khan

School of Allied Health Sciences, Combined Military Hospital, National University of Medical Sciences, Rawalpindi, Pakistan  
dryasserkhan@yahoo.comReceived date: 23<sup>rd</sup> February, 2025Revised date: 1<sup>st</sup> April, 2025Acceptance date: 11<sup>th</sup> April, 2025Published date: 30<sup>th</sup> April, 2025

## 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  $29.50 \pm 8.32$  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.

Abnormal uterine bleeding (AUB) is a common gynecological complaint among women of reproductive age and is frequently associated with uterine fibroids, significantly affecting quality of life and reproductive health. Although ultrasonography is widely used as a first-line diagnostic tool, there is limited local evidence regarding the prevalence, clinical presentation, and ultrasound characteristics of fibroids among women presenting with AUB in tertiary care settings. Existing studies often focus on general etiologies of AUB without detailed evaluation of fibroid-specific features and their correlation with symptoms. Therefore, this study aims to detect uterine fibroids using ultrasound, determine their prevalence, and assess their clinical and imaging characteristics among women of reproductive age presenting with AUB. 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].  $n = z^2 \cdot a \cdot P(1 - P) / d^2$ . Z-value = 1.96 at 95% confidence level ( $\alpha$ ), 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 carry 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  $\leq 0.05$  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)

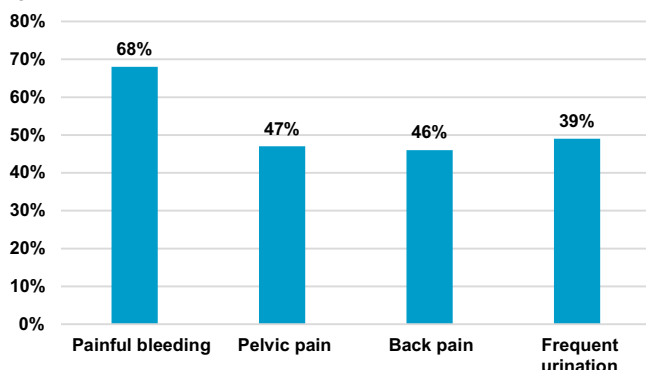
Characteristics	Categories	n (%)
Age Groups of Participants (Years)	15-19	24 (12%)
	20-24	40 (20%)
	25-29	49 (24.50%)
	30-34	28 (14%)
	35-39	30 (15%)
	40-44	18 (9%)
	45-49	11 (5.50%)
Age of Patients (Years), Mean ± SD	29.50 ± 8.332	
Marital Status of Patients	Unmarried	78 (39%)
	Married	122 (61%)

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
<b>n (%)</b>		
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%)
Distortion of the Endometrial Cavity	Not applicable	107 (53.5%)
	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%)	3.064	0.080
Yes	67 (62.6%)	69 (74.2%)	136 (68%)		
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%)	2.258	0.133
Yes	45 (42.1%)	49 (52.7%)	94 (47%)		
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 fundus-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 fundus-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]. This study is limited by its single-center design and non-

probability sampling technique, which may reduce the generalizability of the findings. The cross-sectional nature also limits the ability to establish causal relationships between fibroids and AUB. Additionally, other potential confounding factors such as hormonal status and lifestyle variables were not assessed. Future studies should involve multi-center and longitudinal designs with larger sample sizes to improve external validity. Further research should also explore comparative diagnostic modalities and evaluate long-term clinical outcomes of fibroid-related AUB.

## 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<sup>1</sup>, KTK, ZS, AR<sup>2</sup>

Formal analysis: AR<sup>2</sup>

Writing and Drafting: ZS, AA

Review and Editing: ZS, AA, AR<sup>1</sup>, KTK, ZS, AR<sup>2</sup>

All authors approved the final manuscript and take responsibility for the integrity of the work.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

## REFERENCES

- [1] MacGregor R, Jain V, Hillman S, Lumsden MA. Investigating Abnormal Uterine Bleeding in Reproductive Aged Women. *British Medical Journal*. 2022 Sep; 378. doi: 10.1136/bmj-2022-070906.
- [2] Hill S and Shetty MK. Abnormal Uterine Bleeding in Reproductive Age Women: Role of Imaging in the Diagnosis and Management. In *Seminars in Ultrasound, Computed Tomography and Magnetic Resonance Imaging*. 2023 Dec; 44(6): 511-518. doi: 10.1053/j.sult.2023.10.002.
- [3] Stewart EA, Laughlin-Tommaso SK, Levine D. Uterine Fibroids (Leiomyomas): Epidemiology, Clinical Features, Diagnosis, and Natural History. *Up to Date*. 2019 Mar; 22.
- [4] Gerema U, Kene K, Abera D, Adugna T, Nigussie M, Dereje D, Mulugeta T. Abnormal Uterine Bleeding and

- Associated Factors Among Reproductive Age Women in Jimma Town, Oromia Region, Southwest Ethiopia. *Women's Health*. 2022 Feb; 18: 17455057221077577. doi: 10.1177/17455057221077577.
- [5] Zhang L, Xu F, Huang Y, Xu W, Pu Y, Chen K et al. Epidemiological Features of Uterine Fibroid-Associated Imaging Changes in Chinese Women of Reproductive Age: A Retrospective Study. *BioMed Journal Open*. 2025 Jan; 15(1): e085671.
- [6] Uimari O, Subramaniam KS, Vollenhoven B, Tapmeier TT. Uterine Fibroids (Leiomyomata) and Heavy Menstrual Bleeding. *Frontiers in Reproductive Health*. 2022 Mar; 4: 818243. doi: 10.3389/frph.2022.818243.
- [7] Elmaoğulları S and Aycan Z. Abnormal Uterine Bleeding in Adolescents. *Journal of Clinical Research in Pediatric Endocrinology*. 2018 Jul; 10(3): 191. doi: 10.4274/jcrpe.0014.
- [8] Tsakiridis I, Giouleka S, Koutsouki G, Kostakis N, Kalogiannidis I, Kourtis A et al. Investigation and Management of Abnormal Uterine Bleeding in Reproductive-Aged Women: A Descriptive Review of National and International Recommendations. *The European Journal of Contraception and Reproductive Health Care*. 2022 Nov; 27(6): 504-17. doi: 10.1080/13625187.2022.2112169.
- [9] Hanan SD, Sandhu AA, Badar R. Frequency of Uterine Fibroids between the Age 20 to 40 Years on Ultrasound at FMH. *Pakistan Journal of Allied Health Sciences*. 2024 Jan; 2(1): 1-0.
- [10] Ahmad A, Kumar M, Bhoi NR, Akhtar J, Khan MI, Ajmal M et al. Diagnosis and Management of Uterine Fibroids: Current Trends and Future Strategies. *Journal of Basic and Clinical Physiology and Pharmacology*. 2023 May; 34(3): 291-310. doi: 10.1515/jbcpp-2022-0219.
- [11] Paulinus SO, Ukpong EV, Archibong BE, Ijeveer AW, Usani UE, Archibong SE et al. Ultrasound Evaluation of Uterine Fibroids Among Women of Childbearing Age: A Single Centre Study in Port Harcourt Metropolis. *Global Journal of Pure and Applied Sciences*. 2024 Aug; 30(3): 351-7.
- [12] Talukdar B and Mahela S. Abnormal Uterine Bleeding in Perimenopausal Women: Correlation with Sonographic Findings and Histopathological Examination of Hysterectomy Specimens. *Journal of Mid-Life Health*. 2016 Apr; 7(2): 73-7. doi: 10.4103/0976-7800.185336.
- [13] Qing S and Valliant R. Extending Cochran's Sample Size Rule to Stratified Simple Random Sampling with Applications to Audit Sampling. *Journal of Official Statistics*. 2025 Mar; 41(1): 309-28. doi: 10.1177/0282423X241277054.
- [14] Almuhaitb RA, Alenazi RH, Almebki RA, Alshehri RA, Alemad MM, AlHarbi JM et al. Management of Abnormal Uterine Bleeding Among Reproductive Age Group Women: A Cross-Sectional Study. *Journal of Clinical Medicine*. 2024 Nov; 13(23): 7086. doi: 10.3390/jcm13237086.
- [15] Edzie EK, Dzefi-Tetty K, Brakohiapa EK, Quarshie F, Ken-Amoah S, Cudjoe O et al. Age of First Diagnosis and Incidence Rate of Uterine Fibroids in Ghana. A Retrospective Cohort Study. *PLoS One*. 2023 Mar; 18(3): e0283201. doi: 10.1371/journal.pone.0283201.
- [16] Nguyen PN. Combination of B-Mode Ultrasound and Doppler Ultrasound in Approaching Uterine Intracavitary Pathologies Among Women Above 40 Years with Abnormal Uterine Bleeding: A Multicenter-Based Study from Vietnam. *Journal of Mid-life Health*. 2022 Sep; 13(2): 145. doi: 10.4103/jmh.jmh\_93\_22.
- [17] Viganò S, Smedile A, Cazzella C, Marra P, Bonaffini PA, Sironi S. Abnormal Uterine Bleeding: A Pictorial Review On Differential Diagnosis and Not-So-Common Cases of Interventional Radiology Management. *Diagnostics*. 2024 Apr; 14(8): 798. doi: 10.3390/diagnostics14080798.
- [18] Rasekh Jahromi A, Ebadat H, Jokar M, Taghipour N, Rahmanian V. Optimal Timing of Transvaginal Ultrasound to Diagnose Endometrial Polyps in Women with Abnormal Uterine Bleeding. *The Journal of Obstetrics and Gynaecology of India*. 2024 Jun; 1-8. doi: 10.1007/s13224-024-01993-7.
- [19] Vannuccini S, Petraglia F, Carmona F, Calaf J, Chapron C. The Modern Management of Uterine Fibroids-Related Abnormal Uterine Bleeding. *Fertility and Sterility*. 2024 May. doi: 10.1016/j.fertnstert.2024.04.041.
- [20] Samanta S, Dutta S, Samanta S, Mullick A. An Observational Study on Uterine Myoma in Search of Factors Contributing to Its Symptoms. *Journal of Contemporary Medical Research*. 2019; 6(1): A1-4. doi: 10.21276/ijcmr.2019.6.1.6.