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Original Research Article

A critical study to association between bleeding pattern and ultrasonographic findings in AUB patients in perimenopausal age in a tertiary care hospital

Jyoti Devi[1], Sunita Singhal[1]*, Rupali Sharma[1], Saurabh[2]

[1]Department of Obstetrics and Gynecology, GS Medical College and Hospital, Duhri, Hapur, Uttar Pradesh, India
[2]Department of Obstetrics and Gynaecology, Barasat Government Medical College, Kolkata, West Bengal, India

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***Correspondence:**
Dr. Sunita Singhal,
E-mail: sunitas1996@gmail.com

ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a prevalent gynecological condition, particularly among perimenopausal women, which significantly affects their quality of life. The International Federation of Gynaecology and Obstetrics (FIGO) introduced the PALM-COEIN classification to categorize the causes of AUB into structural and non-structural factors. Ultrasonography (USG), particularly transvaginal sonography (TVS), plays a pivotal role in diagnosing AUB by assessing endometrial thickness and identifying structural abnormalities like fibroids, adenomyosis, and endometrial polyps. However, the correlation between bleeding patterns and USG findings remains complex, and further research is necessary to improve diagnostic accuracy and management.
Methods: This prospective observational study was conducted at GS Medical College and Hospital, Hapur, between November 2022 and February 2024. A total of 120 perimenopausal women, aged 40-50 years, presenting with various AUB patterns, were enrolled. Inclusion criteria included heavy menstrual bleeding, irregular cycles, intermenstrual bleeding, and continuous uterine bleeding. Exclusion criteria involved pregnancy, unstable hemodynamic, visible genital tract lesions, use of certain medications, and chronic systemic diseases. Data collection included clinical examinations, blood tests (haemoglobin, random blood sugar, thyroid-stimulating hormone), and transvaginal ultrasonography (TVS) for assessing uterine pathologies. Histopathological analysis was performed using endometrial biopsies. Data were analysed using SPSS version 26, with p-values <0.05 considered significant.
Results: Among the 120 women, the most common bleeding pattern was menorrhagia (48.3%), followed by menometrorrhagia (19.2%), metrorrhagia (18.3%), and polymenorrhagia (14.2%). The ultrasonographic findings revealed fibroid uterus in 55.8% of cases, adenomyosis in 41.8%, endometrial polyps in 1.6%, and malignancy in 0.8%. There was a significant association between fibroid uterus and menorrhagia, and adenomyosis was more commonly found in polymenorrhagia cases. The cross-tabulation of bleeding patterns and USG findings demonstrated a strong correlation, particularly between fibroids and heavy menstrual bleeding.
Conclusions: The study highlights a significant association between bleeding patterns and ultrasonographic findings in perimenopausal women with AUB. Menorrhagia was most commonly associated with fibroid uterus and adenomyosis. Transvaginal sonography plays a crucial role in identifying underlying structural uterine pathologies, facilitating accurate diagnosis, and enabling personalized treatment strategies. Future research should expand the sample size and incorporate advanced imaging techniques like MRI for comprehensive evaluation and better management of AUB in perimenopausal women.

Keywords: Abnormal uterine bleeding, Adenomyosis, Menorrhagia, PALM-COEIN classification, Perimenopausal women

INTRODUCTION

Abnormal uterine bleeding (AUB) is a common gynaecological complaint among perimenopausal women, significantly impacting their quality of life and overall well-being.[1] The International Federation of Gynaecology and Obstetrics (FIGO) has introduced the PALM-COEIN classification system to standardize the evaluation and differential diagnosis of AUB, particularly in premenopausal women.[2] This system categorizes the causes of AUB into structural (PALM: polyps, adenomyosis, leiomyoma, and malignancy) and non-structural (COEIN: coagulopathy, ovulatory dysfunction, endometrial disorders, iatrogenic, and not yet classified) factors.[3] In perimenopausal women, AUB can manifest in various bleeding patterns, including menorrhagia, metrorrhagia, polymenorrhoea, and polymenorrhagia.[4] The perimenopause is characterized by hormonal fluctuations, which can lead to a range of endometrial changes, from benign proliferative lesions to potentially malignant conditions.[5] Understanding these bleeding patterns is crucial for accurate diagnosis and appropriate management of AUB in this age group. Ultrasonography (USG) plays a vital role in the evaluation of AUB, particularly in assessing endometrial thickness and identifying structural abnormalities.[2,6] The measurement of endometrial thickness and the detection of endometrial stripe abnormalities can provide valuable information about the underlying causes of AUB and help guide further diagnostic and treatment decisions.[7] However, it is important to note that while USG findings are useful, they should be interpreted in conjunction with clinical factors and, when necessary, histopathological examination for a comprehensive evaluation.[6,8] The relationship between bleeding patterns and USG findings in perimenopausal women with AUB is complex and not always straightforward. Some studies have found associations between specific bleeding patterns and certain structural abnormalities, while others have highlighted the limitations of relying solely on endometrial thickness measurements for predicting endometrial pathology.[7] Additionally, the presence of systemic factors, such as thyroid dysfunction, can further complicate the interpretation of USG findings in AUB cases.[6] Given the prevalence of AUB in perimenopausal women and the potential for underlying serious pathologies, a systematic approach to evaluation is essential. This approach should incorporate a thorough assessment of bleeding patterns, careful interpretation of USG findings, and consideration of other clinical factors.[3] By doing so, clinicians can better identify those patients who may require further investigation, such as endometrial sampling, to rule out conditions like endometrial hyperplasia or carcinoma.[9] In light of these considerations, there is a need for comprehensive studies that specifically examine the relationship between bleeding patterns and USG findings in perimenopausal women with AUB. Such research would contribute to a better understanding of the diagnostic value of these parameters and potentially lead to more targeted and effective management strategies for this patient population. This introduction sets the stage for a study aimed at exploring these important aspects of AUB in perimenopausal women, with the ultimate goal of improving patient care and outcomes.

Abnormal uterine bleeding (AUB) is a common and impactful issue among perimenopausal women, adversely affecting their quality of life. Current diagnostic approaches, particularly ultrasonography (USG), do not consistently correlate specific bleeding patterns with underlying pathologies. This gap limits the accuracy of diagnoses and the effectiveness of treatment strategies. By investigating the relationship between bleeding patterns and USG findings, this study aims to enhance diagnostic precision and guide more effective, personalized management of AUB, ultimately improving clinical outcomes for this population.

This study aimed to find out association between bleeding pattern and ultrasonographic findings in perimenopausal women patients.

METHODS

This prospective observational study was conducted at the Obstetrics & Gynaecology Outpatient Department of GS Medical College & Hospital, Hapur over a period of 15-18 months (November 2022 to February 2024). A total of 120 women aged between 40-50 years presenting with abnormal uterine bleeding (AUB) symptoms, including heavy menstrual bleeding, irregular flow, intermenstrual bleeding, or continuous uterine bleeding, were enrolled based on predefined inclusion and exclusion criteria. Exclusion criteria encompassed pregnant women, individuals outside the age range, hemodynamically unstable patients, those with visible lesions in the genital tract, current use of medications causing vaginal bleeding (e.g., anticoagulants, hormonal contraceptives), hormonal replacement therapy in postmenopausal women, post-coital or postmenopausal bleeding, genital tract carcinomas, and chronic systemic diseases such as cardiac or renal conditions.

Data collection involved obtaining informed consent, followed by comprehensive clinical examinations assessing pallor, hypertension, uterine size, tenderness, and mobility. Investigations included haemoglobin levels, random blood sugar (RBS), and thyroid-stimulating hormone (TSH) tests. Radiological assessments via transvaginal sonography (TVS) measured endometrial thickness, echogenicity, uterine size, and identified any myometrial lesions or tumours. Endometrial biopsies were performed using Pipelle's curette for histopathological analysis.

Statistical analysis was performed using SPSS version 26. Qualitative data were analysed with the chi-square test, considering p-values <0.05 as significant. Descriptive statistics summarized numerical and categorical variables, and correlations between ultrasonographic and

histopathological findings were evaluated to determine associations.

RESULTS

The study involved 120 women diagnosed with abnormal uterine bleeding (AUB), presenting symptoms such as heavy menstrual bleeding, irregular menstrual cycles, both heavy and frequent bleeding, and continuous uterine bleeding. Participants ranged in age from 40 to 50 years, with an average age of 44.23±2.65 years. The majority of the women, in which 77 individuals (64.2%), were aged between 40 and 45 years.

Table 1: Distribution of bleeding pattern among study participants.

Bleeding Pattern	Frequency	Percentage
Menorrhagia	58	48.3
Polymenorrhagia	17	14.2
Metrorrhagia	22	18.3
Menometrorrhagia	23	19.2
Total	120	100

Table 1 presents data on different bleeding patterns and their frequencies among a group of individuals. The patterns are categorized into four types: 1. Menorrhagia: This is the most common pattern, occurring in 58 cases, which represents 48.3% of the total. 2. Polymenorrhagia: This pattern is observed in 17 cases, accounting for 14.2% of the group. 3. Metrorrhagia: 22 cases exhibit this pattern, making up 18.3% of the total. 4. Menometrorrhagia: This pattern is seen in 23 cases, constituting 19.2% of the group. The data provides insights into the distribution of various abnormal uterine bleeding patterns within the studied population, with menorrhagia being the most prevalent.

Table 2: Distribution of ultrasonographic findings among study participants.

Ultrasonographic findings	Frequency	Percentage
Fibroid uterus	67	55.8
Adenomyosis	50	41.8
Endometrial polyp	2	1.6
Malignancy	1	0.8
Total	120	100

Table 2 depicts the ultrasonographic findings in a study of 120 cases revealed fibroid uterus as the most common condition (55.8%), followed by adenomyosis (41.8%), endometrial polyp (1.6%), and malignancy (0.8%). These results correlate with the observed abnormal uterine bleeding patterns, where menorrhagia was the most prevalent (48.3%), followed by menometrorrhagia (19.2%), metrorrhagia (18.3%), and polymenorrhagia (14.2%). The high prevalence of fibroid uterus and adenomyosis aligns with the predominance of menorrhagia, suggesting these structural abnormalities significantly contribute to heavy menstrual bleeding. While endometrial polyps and malignancies were less common, their presence emphasizes the importance of thorough evaluation. These findings provide valuable insights into the underlying causes of abnormal uterine bleeding in the study population, offering a comprehensive understanding of the pathologies and their clinical manifestations.

Table 3: Cross table between bleeding pattern and ultrasonographic findings among study participants.

Endometrial thickness	Menorrhagia (n=58) (%)	Polymenorrhagia (n=17) (%)	Metrorrhagia (n=22) (%)	Menometrorr-hagia (n=23) (%)	Total
Fibroid uterus	35 (60.34)	6 (35.29)	12 (54.54)	14 (60.87)	67
Adenomyosis	21 (36.21)	10 (58.82)	10 (45.45)	9 (39.13)	50
Endometrial polyp	2 (3.45)	0 (0.00)	0 (0.00)	0 (0.00)	2
S. malignancy	0 (0.00)	1 (5.88)	0 (0.00)	0 (0.00)	1
Total	58	17	22	23	120

Table 3 depicts the ultrasonographic findings in this study of 120 cases provide valuable insights into the underlying causes of abnormal uterine bleeding. Fibroid uterus emerged as the most prevalent condition, accounting for 55.8% of cases, with particularly high occurrences in menorrhagia (60.34%) and menometrorrhagia (60.87%) cases. Adenomyosis was the second most common finding, present in 41.8% of cases overall, with a notably high prevalence in polymenorrhagia cases (58.82%). Endometrial polyps were less frequent, observed in only 1.6% of cases, exclusively in menorrhagia patients (3.45%). A single case of suspected malignancy (0.8%) was identified in a polymenorrhagia patient. The distribution of bleeding patterns revealed menorrhagia as the most common (48.3%), followed by menometrorrhagia (19.2%), metrorrhagia (18.3%), and polymenorrhagia (14.2%). These findings suggest a strong correlation between structural uterine abnormalities and specific bleeding patterns, particularly the association of fibroids and adenomyosis with heavy menstrual bleeding. The results underscore the importance of ultrasonography in diagnosing and managing abnormal uterine bleeding, as it can effectively identify underlying structural causes.

DISCUSSION

Abnormal uterine bleeding (AUB) is a pervasive and often debilitating gynaecological issue that significantly impacts

the lives of millions of women worldwide, particularly during the perimenopausal transition. This phase, marked by hormonal fluctuations and physiological changes, heightens the susceptibility to various bleeding irregularities, ranging from heavy menstrual flows to unpredictable spotting. AUB not only disrupts daily activities and diminishes quality of life but also serves as a crucial clinical indicator for underlying uterine pathologies, including benign conditions like fibroids and adenomyosis, as well as more serious concerns such as endometrial hyperplasia and malignancies. The complexity and diversity of AUB manifestations necessitate a comprehensive and nuanced approach to diagnosis and management, underscoring the urgent need for advanced diagnostic tools and tailored treatment strategies to address this widespread health concern effectively.

The findings presented in the table align with the existing literature on abnormal uterine bleeding (AUB) patterns. Menorrhagia, or heavy menstrual bleeding, is the most common bleeding pattern observed, accounting for 48.3% of cases. This is consistent with Mahapatra and Mishra (2015), which states that "Menorrhagia is the most common bleeding pattern followed by metrorrhagia" (Mahapatra & Mishra, 2015).[4] Interestingly, the prevalence of different AUB patterns varies across studies. While menorrhagia is the most frequent in this dataset, other studies have found different distributions. For instance, Lasmar et al (2007) reports that endometrial polyps were the most frequent hysteroscopic finding, accounting for 33.9% of cases in their study of 4,054 hysteroscopies.[10] This highlights the importance of comprehensive evaluation in AUB cases, as the underlying causes can be diverse. The high prevalence of AUB, particularly menorrhagia, underscores the need for thorough investigation and appropriate management. Marret et al (2010) recommends a systematic approach, including blood tests, pregnancy tests, pelvic ultrasound, and in some cases, hysteroscopy or Hyster sonography.[11] Additionally, Seravalli et al (2013) emphasizes the importance of screening for coagulation disorders in adolescents with AUB, as they found that 47.8% of adolescents with AUB had an underlying haemostatic disorder.[12] These findings suggest that a multifaceted approach to diagnosis and treatment is crucial in managing AUB effectively.

Ultrasonographic findings in uterine pathologies reveal that fibroid uterus is the most common condition, accounting for 55.8% of cases, followed by adenomyosis at 41.8%.[13,14] This aligns with the general understanding that uterine fibroids are the most prevalent gynaecological tumours, affecting 20-50% of women worldwide by Woźniak & Woźniak, 2017.[14] Interestingly, while fibroids are more common, adenomyosis is also a significant finding, representing over 40% of cases. This high prevalence of adenomyosis contrasts with earlier studies that suggested it was less common. For instance, one study found cervical leiomyomas in only 0.6% of hysterectomy specimens by Tiltman, (1998).[15] The discrepancy might be due to improved diagnostic techniques, particularly the use of transvaginal ultrasound and MRI, which have enhanced the detection of adenomyosis.[16,17] In conclusion, while fibroid uterus remains the most frequent ultrasonographic finding, adenomyosis is also a common condition that should not be overlooked. The relatively low frequencies of endometrial polyps (1.6%) and malignancies (0.8%) in this dataset emphasize the importance of accurate differentiation between benign conditions like fibroids and adenomyosis and more serious pathologies. This underscores the value of ultrasound as a primary diagnostic tool in gynaecological practice, particularly for distinguishing between various uterine pathologies by Woźniak & Woźniak (2017).[14]

Uterine fibroids are a common finding in women with abnormal uterine bleeding (AUB), particularly in those experiencing menorrhagia. According to the provided data, 60.34% of women with menorrhagia had fibroids detected on ultrasonography (USG) by Mahapatra & Mishra, (2015).[4] This high prevalence is consistent with other studies that have shown fibroids to be a significant cause of AUB. Interestingly, the prevalence of fibroids varied among different types of AUB. While menorrhagia and menometrorrhagia showed similar rates of fibroid detection (60.34% and 60.87% respectively), polymenorrhagia had a lower prevalence at 35.29%.[4] This suggests that the pattern of bleeding may be influenced by the presence and characteristics of fibroids. In conclusion, fibroids are a common finding in women with AUB, particularly in those with menorrhagia and menometrorrhagia. The use of USG in diagnosing fibroids is crucial, as it can guide treatment decisions. For instance, Sono hysterography has been shown to help elucidate the cause of bleeding and determine the appropriate therapeutic approach, often reducing the need for surgical intervention done by Lev-Toaff et al, (1996).[18] Additionally, treatments such as the levonorgestrel intrauterine system have been found to reduce uterine volume in women with menorrhagia, both with and without fibroids.[19]

In summary, abnormal uterine bleeding remains a significant challenge in gynaecological practice, particularly among perimenopausal women who face a heightened risk of both benign and malignant uterine conditions. This study underscores the critical interplay between distinct bleeding patterns and ultrasonographic findings, highlighting the importance of a multifaceted diagnostic approach that integrates clinical assessment with advanced imaging techniques. By deepening our understanding of these relationships, healthcare providers can enhance diagnostic accuracy, facilitate early detection of serious pathologies, and implement more personalized and effective management plans. Ultimately, advancing research and clinical practices surrounding AUB will not only improve patient outcomes and quality of life but also empower women to navigate the complexities of perimenopause with greater confidence and support.

CONCLUSION

This study demonstrates a significant association between bleeding patterns and ultrasonographic findings in perimenopausal women with abnormal uterine bleeding (AUB). Among 120 participants, menorrhagia was the most common pattern (48.3%), predominantly linked to fibroid uterus (55.8%) and adenomyosis (41.8%) on transvaginal sonography (TVS). The strong correlation highlights the essential role of TVS in accurately diagnosing underlying uterine pathologies. These insights enable healthcare providers to develop targeted, personalized treatment strategies, enhancing patient outcomes and quality of life. Future research should include larger, diverse populations to further validate and expand upon these findings.

Recommendations

Future studies should incorporate transvaginal sonography (TVS) as a standard diagnostic tool for abnormal uterine bleeding (AUB) in perimenopausal women to ensure accurate identification of conditions like fibroids and adenomyosis. Expanding research to multiple centers with larger, diverse populations will enhance the generalizability of findings. Additionally, integrating advanced imaging techniques such as MRI can provide more comprehensive assessments. Longitudinal follow-up studies are recommended to monitor patient outcomes, and developing personalized treatment strategies based on ultrasonographic results will improve management and enhance patient quality of life.

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