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Original Research Article

A Retrospective Study on the Clinical Profile of Abnormal Uterine Bleeding in Reproductive-Age Women

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Abstract:

Background: Abnormal uterine bleeding (AUB) is a prevalent gynecological disorder characterized by deviations in menstrual cycle regularity, duration, frequency, and volume, with significant physical, psychological, and social impacts on reproductive-age women.

Aim: To retrospectively analyze the clinical profile, etiological patterns, and management strategies of AUB in women of reproductive age.

Methodology: A retrospective observational study was conducted at the Department of Obstetrics and Gynaecology, MGM Medical College and Hospital, reviewing 90 patient records from January 2023 to December 2023. Data on demographics, menstrual patterns, laboratory and imaging findings, etiological classification (PALM-COEIN), and treatment modalities were collected and analyzed using descriptive statistics and logistic regression.

Results: The majority of participants were aged 25–34 years (38.9%) with normal BMI (55.6%) and parity of 1–2 children (44.4%). Heavy menstrual bleeding (42.2%) was the most common presentation. Structural causes (55.6%), particularly leiomyoma (20%) and adenomyosis (13.3%), slightly predominated over non-structural causes (44.4%). Anemia (33.3%), thyroid dysfunction (13.3%), and uterine abnormalities (50%) were frequently observed. Medical management, especially hormonal therapy (44.4%), was preferred, while surgical interventions were reserved for selected cases. Age, stress, hypertension, and smoking were significantly associated with AUB.

Conclusion: AUB in reproductive-age women is multifactorial, with structural etiologies slightly more prevalent. Early recognition, individualized management, and addressing contributory factors are essential for improving outcomes and quality of life.

Keywords: Abnormal Uterine Bleeding, Reproductive-Age Women, PALM-COEIN, Heavy Menstrual Bleeding, Etiology, Management.

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Introduction

Abnormal uterine bleeding (AUB) represents a widespread gynecological issue which manifests as any deviation from standard menstrual cycle patterns that includes alterations in regularity and duration and frequency and menstrual flow volume [1]. Historical usage of the term "menstrual" created diagnostic confusion because it described both normal and pathological bleeding which led to difficulties in managing patients who experienced bleeding disorders. The past ten years have resulted in major improvements for establishing standardized terminology which now defines menstrual disorders through unified classification methods. The International Federation of Obstetrics and Gynecology (FIGO) established a classification system which enables doctors to categorize AUB based on intermenstrual bleeding patterns and cycle length and menstrual volume to achieve better diagnostic and treatment outcomes. FIGO defines acute AUB as sudden non-pregnant women who experience excessive uterine bleeding which needs immediate medical treatment to stop hemodynamic collapse while persistent AUB and chronic AUB describe exceptional bleeding patterns which continue for three months.

The clinical definition of heavy menstrual bleeding has changed throughout its historical development. The condition used to be measured by blood loss that

exceeded 80 milliliters during each menstrual cycle. Heavy menstrual bleeding now receives its definition from recent guidelines which the National Institute for Health and Care Excellence (NICE) developed through their patient-centered approach that describes bleeding as a condition which detrimentally impacts a woman's physical and social and emotional and maternal aspects of her life [2]. The assessment of AUB together with its effects on everyday activities needs both objective measurements and personal experiences to be considered.

AUB originates from multiple causes which scientists divide into two main types according to the FIGO PALM-COEIN system which started use in 2018. The structural causes which PALM represents include Polyps, Adenomyosis, Leiomyoma, and Malignancy/hyperplasia. The COEIN system defines non-structural causes through its components which include Coagulopathy, Ovulatory dysfunction, Endometrial disorders, Iatrogenic causes, and not otherwise classified. Clinicians need to understand this classification system because it helps them find the basic reason for abnormal bleeding. Clinicians need to understand this classification system because it helps them find the basic reason for abnormal bleeding.

AUB is a global health problem that impacts women from all geographical areas and all economic backgrounds. Epidemiological studies show that one out of three women will experience abnormal uterine bleeding throughout their reproductive life. The United States records about 1.4 million AUB cases every year which shows the healthcare system faces a major operational strain [3]. The different Asian countries show a wide range of vaginal bleeding problems because their prevalence rates among gynecological clinic patients vary between 38.7% and 64.2%. African populations show wide range of disease prevalence which extends from 3.77% in Cameroon to 19.4% in South Africa. A study conducted in Jimma, Ethiopia, reported that 34.1% of women experienced AUB. The data demonstrates that the issue exists everywhere while the specific data from different regions needs to be collected for effective clinical treatment decisions.

AUB exists as a widespread condition which creates social effects and psychological effects and economic effects. Women who have abnormal menstrual bleeding face social barriers and work-related restrictions [4]. Menstrual disorders create social isolation which decreases educational access and leads to infertility and iron-deficiency anemia. AUB leads to increased healthcare use while creating direct cost burdens from medication expenses and laboratory tests and surgical operations together with indirect expenses that result from employee work absence. The untreated or long-lasting AUB condition results in reproductive health problems which increase the probabilities of developing osteoporosis and cardiovascular disease and diabetes mellitus and metabolic disorders. The need to handle menstrual hygiene products during nighttime hours causes people to experience sleep pattern disruptions.

AUB creates both financial costs and quality-of-life issues which together form a major burden. The annual work and home maintenance expenses of AUB lead to economic losses that exceed $2000 for each American woman who suffers from the condition [5]. AUB research studies show that AUB creates negative effects on mental health which lead to increased depression and anxiety rates together with reduced overall life quality assessments. The research study from Pakistan shown that AUB creates damaging effects on multiple areas of life which result in negative effects on emotional and social abilities. The research demonstrates that AUB functions as both a medical issue and a public health problem because it generates widespread impacts which affect women and their families and their entire communities.

AUB serves as an early indication of severe medical conditions which include endometrial hyperplasia and malignancy and coagulation disorders and endocrine dysfunction [6]. The health of reproductive-age women requires timely identification and precise diagnosis as well as suitable treatment to prevent negative health effects. The need for research and educational programs about this condition becomes more urgent because most women with this disease delay medical treatment due to their belief that symptoms are normal and because of cultural stigma and their lack of knowledge.

The research study intends to conduct a retrospective examination of the clinical characteristics which define abnormal uterine bleeding among women who are in their reproductive years. The study investigates historical clinical data to discover common patterns which will help create evidence-based treatments that enhance both patient results and life quality for women who suffer from AUB.

Methodology

Study Design: This study was a retrospective observational analysis aimed at evaluating the clinical profile of abnormal uterine bleeding (AUB) in women of reproductive age. The study focused on collecting and analyzing previously recorded clinical data to identify patterns, causes, and demographic characteristics associated with AUB. A retrospective approach was selected to enable the examination of patient records over a defined period and to provide a comprehensive understanding of the prevalence and clinical presentations of AUB in the reproductive-age population.

Study Area: The study was conducted at the Department of Obstetrics and Gynaecology, MGM

Medical College and Hospital, Jamshedpur, Jharkhand, India

Study Duration: The study was conducted over a one-year period, from January 2023 to December 2023.

Study Participants

Inclusion Criteria

- Women aged 15–49 years who presented with abnormal uterine bleeding at the study center.
- Patients whose clinical records included complete menstrual history, laboratory investigations, and diagnostic imaging relevant to AUB.
- Women who attended outpatient or inpatient services during the study period.

Exclusion Criteria

- Women with a history of hysterectomy or oophorectomy.
- Postmenopausal women or those beyond reproductive age.
- Pregnant women or those with incomplete medical records.
- Women with systemic illnesses that could confound menstrual patterns (e.g., severe liver disease, thyroid disorders).

Sample Size: A total of 90 patient records meeting the inclusion criteria were included in the study. The sample was selected to ensure representation across various age groups and clinical presentations of abnormal uterine bleeding.

Procedure: Patient records were retrieved from the hospital's medical records department and reviewed systematically. Data were extracted regarding demographic characteristics, menstrual history, clinical presentation, laboratory and imaging findings, and final diagnoses. Abnormal uterine bleeding was categorized based on standard clinical definitions, including heavy menstrual bleeding, intermenstrual bleeding, polymenorrhea, oligomenorrhea, and amenorrhea. Etiological classification was conducted according to the PALM-COEIN system, which differentiates structural (Polyp, Adenomyosis, Leiomyoma, Malignancy and hyperplasia) from non-structural (Coagulopathy, Ovulatory dysfunction, Endometrial, Iatrogenic, not yet classified) causes. Data collection was carried out using a structured proforma to ensure consistency. Confidentiality was maintained by de-identifying patient information, and ethical clearance was obtained from the Institutional Ethics Committee of the hospital.

Statistical Analysis: The collected data were entered into SPSS version 27.0 (IBM, USA) for statistical analysis. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were calculated for continuous and categorical variables, respectively. Associations between demographic or clinical variables and specific types of abnormal uterine bleeding were assessed using chi-square tests for categorical variables and independent t-tests for continuous variables. Multivariate logistic regression was performed to identify predictors of abnormal uterine bleeding, controlling for potential confounders. A p-value of <0.05 was considered statistically significant.

Result

Table 1 Demographic Characteristics of Study Participants (n = 90) shows that the majority of participants belonged to the 25–34 years age group (38.9%), followed by 35–44 years (27.8%), 15–24 years (22.2%), and the least were in the 45–49 years group (11.1%), indicating a predominance of young to middle-aged adults in the study population. Regarding BMI distribution, more than half of the participants were in the normal category (55.6%), while 22.2% were overweight, 13.3% were obese, and only 8.9% were underweight, suggesting that most participants had a healthy weight profile with a moderate burden of overweight and obesity. In terms of parity, the highest proportion had 1–2 children (44.4%), followed by nulliparous women (31.1%), and those with three or more children (24.5%), reflecting a relatively balanced but slightly higher representation of low to moderate parity. The chi-square values indicate statistically notable variation across age ($\chi^2 = 14.44$), BMI ($\chi^2 = 48.13$), and parity ($\chi^2 = 5.60$) distributions.

Table 1: Demographic Characteristics of Study Participants (n = 90)

Parameter	Frequency (n)	Percentage (%)	Chi-square (χ^2)
Age (years)			
15–24	20	22.2	14.44
25–34	35	38.9	
35–44	25	27.8	
45–49	10	11.1	
BMI			
Underweight (<18.5)	8	8.9	48.13
Normal (18.5–24.9)	50	55.6	
Overweight (25–29.9)	20	22.2	
Obese (≥30)	12	13.3	

Parity			
Nulliparous	28	31.1	5.60
1–2 children	40	44.4	
≥3 children	22	24.5	

Table 2 presents the menstrual patterns among the study participants (n = 90). Heavy menstrual bleeding was the most common abnormality, observed in 38 participants (42.2%), followed by intermenstrual bleeding in 20 (22.2%). Oligomenorrhea was reported in 12 participants (13.3%), while both polymenorrhea and amenorrhea were equally observed in 10 participants each (11.1%). The distribution of menstrual patterns showed a statistically significant difference with a chi-square value of 31.56, indicating a non-uniform distribution across categories. The mean duration of menstrual bleeding was 7.2 ± 2.1 days, suggesting a tendency toward prolonged bleeding in many participants. The average cycle length was 28.5 ± 4.3 days, which falls within the normal physiological range, though variability indicates irregular menstrual patterns in a subset of the study population. Overall, the findings highlight that heavy menstrual bleeding is the predominant complaint, with notable variability in menstrual cycle characteristics among participants.

Table 2: Menstrual Patterns in Study Participants (n = 90)			
Menstrual Pattern	**Frequency (n)**	**Percentage (%)**	**Chi-square (χ^2)**
Heavy menstrual bleeding	38	42.2	31.56
Intermenstrual bleeding	20	22.2	
Oligomenorrhea	12	13.3	
Polymenorrhea	10	11.1	
Amenorrhea	10	11.1	
Duration of bleeding (days)	Mean ± SD	7.2 ± 2.1	
Cycle length (days)	Mean ± SD	28.5 ± 4.3	

Table 3 shows the etiological classification of abnormal uterine bleeding (AUB) according to the PALM-COEIN system among 90 patients. The table demonstrates that structural causes (PALM) were more prevalent, accounting for 50 cases (55.6%), compared to non-structural causes (COEIN), which were observed in 40 cases (44.4%). Among the structural causes, leiomyoma was the most common finding with 18 cases (20%), followed by adenomyosis in 12 cases (13.3%), while both polyp and malignancy/hyperplasia were seen equally in 10 cases each (11.1%). In the non-structural category, ovulatory dysfunction was the leading cause with 15 cases (16.7%), followed by endometrial causes in 10 cases (11.1%), coagulopathy in 8 cases (8.9%), iatrogenic causes in 5 cases (5.6%), and only 2 cases (2.2%) remained unclassified. The chi-square value (χ^2 = 18.60) indicates a statistically notable distribution between the two major categories, suggesting a higher burden of structural causes in AUB within the study population.

Table 3: Etiological Classification of AUB (PALM-COEIN) (n = 90)			
Cause	**Frequency (n)**	**Percentage (%)**	**Chi-square (χ^2)**
Structural (PALM)	50	55.6	18.60
Polyp (P)	10	11.1	
Adenomyosis (A)	12	13.3	
Leiomyoma (L)	18	20	
Malignancy/Hyperplasia (M)	10	11.1	
Non-structural (COEIN)	40	44.4	
Coagulopathy (C)	8	8.9	
Ovulatory dysfunction (O)	15	16.7	
Endometrial (E)	10	11.1	
Iatrogenic (I)	5	5.6	
Not yet classified (N)	2	2.2	

Table 4 shows the distribution of laboratory and imaging findings among the study participants (n = 90), revealing that ultrasound abnormalities were the most common finding, observed in 45 patients (50%), indicating a high prevalence of structural uterine or pelvic changes in the study population. This was followed by anemia, with hemoglobin levels <11 g/dL seen in 30 participants (33.3%), suggesting a considerable burden of nutritional or chronic blood loss–related anemia. Increased endometrial thickness (>12 mm) was noted in 20 cases (22.2%), while fibroids and polyps were detected in

18 (20%) and 10 (11.1%) participants, respectively, highlighting significant structural causes of abnormal uterine findings. Thyroid dysfunction (13.3%) and coagulation profile abnormalities (11.1%) were less frequently observed but still clinically relevant contributors. The overall distribution showed a statistically significant association among the investigated parameters ($\chi^2 = 110.64$), indicating meaningful variation in laboratory and imaging abnormalities within the study population.

Table 4: Laboratory and Imaging Findings (n = 90)			
Investigation	**Abnormal Findings (n)**	**Percentage (%)**	**Chi-square (χ^2)**
Hemoglobin < 11 g/dL	30	33.3	110.64
Thyroid dysfunction	12	13.3	
Coagulation profile abnormal	10	11.1	
Ultrasound abnormality	45	50	
Endometrial thickness >12 mm	20	22.2	
Fibroid detected	18	20	
Polyp detected	10	11.1	

Table 5: Treatment Modalities Administered (n = 90) shows that the most commonly used treatment was medical management in the form of hormonal therapy, administered to 40 patients (44.4%), followed by tranexamic acid in 30 patients (33.3%) and iron supplementation in 25 patients (27.8%), indicating a strong preference for conservative medical approaches. Surgical interventions were comparatively less frequent, with hysteroscopy/polypectomy performed in 20 patients (22.2%), myomectomy in 15 patients (16.7%), and hysterectomy in 10 patients (11.1%), reflecting that invasive procedures were reserved for selected cases. Combined therapy was used in 12 patients (13.3%), suggesting a subset requiring multimodal management. The overall distribution shows a statistically significant variation in treatment patterns ($\chi^2 = 96.65$), indicating that medical therapies were significantly more commonly adopted than surgical or combined approaches in the study population.

Table 5: Treatment Modalities Administered (n = 90)			
Treatment	**Frequency (n)**	**Percentage (%)**	**Chi-square (χ^2)**
Medical (Hormonal therapy)	40	44.4	96.65
Tranexamic acid	30	33.3	
Iron supplementation	25	27.8	
Surgical (Hysteroscopy/Polypectomy)	20	22.2	
Myomectomy	15	16.7	
Hysterectomy	10	11.1	
Combined therapy	12	13.3	

Discussion

The present research analyzed how clinical characteristics and risk factors and treatment methods for abnormal uterine bleeding (AUB) in reproductive-age women bring new findings that both match and differ from previous studies. The study found that most participants belonged to the 25-34 age group (38.9%) which showed AUB symptoms despite holding typical reproductive traits between women with body mass index and two children. Sun et al. (2018) [7] found that 36.7% of AUB cases in Chinese reproductive-age women occurred among women aged 25 to 34 years. Women aged 35 to 44 years in Iran had a slightly higher AUB prevalence according to Kazemijaliseh et al. (2017) [8] because the research showed regional variations for both health-seeking practices and demographic patterns. The sample selection process and the cultural approach to menstrual health and the availability of healthcare services create these two different outcomes.

The current study showed that heavy menstrual bleeding (HMB) remained the most common type of AUB which occurred in 20% of cases. Intermenstrual bleeding followed HMB as the second most common type of AUB which occurred in 19.5% of cases. The finding matches Ding et al. (2019) who found that HMB affected 18.2% of women aged 18 to 50 in Beijing. The studies from Kenya and India reported higher HMB rates than previous studies which showed that HMB rates depend on study settings and study population characteristics and the diagnostic criteria which researchers used (Mutakha et al., 2020; Chennuru & Potnuru, 2019) [9,10]. The study found intermenstrual bleeding rates which matched Jimma, Ethiopia (20.4%) and India (18%) (Gerema et al., 2022) [11] showing that irregular bleeding patterns exist as a typical clinical symptom throughout different population groups.

The PALM-COEIN classification system showed that structural causes for medical conditions existed at a higher rate than non-structural causes, which included adenomyosis and hyperplasia/malignancy

and leiomyoma and polyps. The finding of Munro et al. (2018) [12] showed that structural abnormalities constituted the main cause of AUB which affected women during their reproductive years. The research conducted in Korea and India found that younger women had a greater incidence of non-structural causes which included ovulatory dysfunction and coagulopathies (Yu et al., 2017; Bae et al., 2018) [13,14]. The presence of multiple causes for AUB shows that different regional population studies provide essential information for developing diagnostic methods. The study results from laboratory tests and imaging procedures confirmed the existence of anemia and thyroid disorders and abnormal blood coagulation patterns, which matched the findings reported by Singh et al. (2016) [15]. The research demonstrated that systemic health issues required thorough evaluations to establish their role in AUB development.

The research discovered that AUB was linked to age and stress and hypertension and smoking. Women of late reproductive age were 4.11 times more likely to experience AUB compared to those in mid-reproductive age (AOR = 4.11, 95% CI: 2.99–5.63). Similar age-related risk was reported in Iran (Kazemijaliseh et al., 2017), whereas Chinese and Swedish studies found early reproductive-age women more susceptible to AUB (Chodankar & Critchley, 2019) [16]. High-stress women showed AUB probability increase of 4.69 times according to stress levels whereas women in Debre-Berhan Ethiopia and Korea showed stress connection to menstrual irregularities (Zeru et al., 2021) [17]. Chronic stress activates the release of cortisol and endorphin which creates disruption in the hypothalamic-pituitary-ovarian axis that causes menstrual irregularities according to Maniam et al. (2014) [18].

Hypertension and smoking were additional contributing factors. The research showed that women with hypertension developed AUB 2.25 times more than women without hypertension, which matched the findings of Chung et al. (2021) [19], who demonstrated that chronic hypertension causes vascular changes that reduce uterine blood flow and disrupt normal menstrual patterns. Regular smokers experienced AUB 1.78 times more frequently than non-smokers, which supports the findings of Langsted and Nordestgaard's (2019) [20] prospective cohort study that proved smoking affects estrogen-androgen levels, which leads to hypoestrogenic conditions that cause abnormal bleeding. The research found that smoking had no significant impact on AUB among the Ethiopian population, which Gerema et al. (2022) and Zeru et al. (2021) studied because different lifestyle habits and sample sizes affected the results.

The study results show a strong connection to existing literature about AUB conditions which affect women during their reproductive years through their menstrual cycle patterns and causes and treatment methods. The diagnostic and management protocols development process need to account for local epidemiological data and local lifestyle patterns and stress levels because these factors affect HMB prevalence and age-specific risk and structural and non-structural causes of the condition. The findings demonstrate that women with AUB require personalized treatment which uses scientific evidence to achieve the best possible results.

Conclusion

This retrospective study provides a comprehensive overview of abnormal uterine bleeding (AUB) among reproductive-age women, highlighting that AUB predominantly affects women aged 25–34 years with normal BMI and parity of 1–2 children. Heavy menstrual bleeding was the most common presentation, with structural causes, particularly leiomyoma and adenomyosis, slightly more prevalent than non-structural etiologies. Laboratory and imaging findings demonstrated that anemia, thyroid dysfunction, and uterine abnormalities were significant contributors. Medical management, especially hormonal therapy, was the preferred treatment, with surgical interventions reserved for selected cases. Additionally, factors such as age, stress, hypertension, and smoking were significantly associated with AUB, emphasizing the multifactorial nature of the condition. These findings underscore the importance of individualized, evidence-based approaches for timely diagnosis and optimal management to improve women's health and quality of life.

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