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A study to correlate clinical with pathological findings in abnormal uterine bleeding (AUB)

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Abstract
Introduction: Abnormal uterine bleeding (AUB) poses a significant health and financial burden, especially in perimenopausal women. Despite the PALM-COEIN classification, gaps persist in correlating clinical and histopathological aspects. Our study, utilizing diagnostic modalities like Ultrasonography, Hysteroscopy, and Endometrial sampling, seeks to enhance diagnostic precision in AUB, contributing to improved management strategies and patient outcomes.
Materials and Methods: This descriptive study investigated Abnormal Uterine Bleeding (AUB) in 126 women aged 35 and above at our hospital from September 2019 to February 2021. The study utilized the PALM-COEIN classification system for categorizing AUB causes. Inclusion criteria covered various AUB presentations, while exclusion criteria excluded specific conditions. Data collection involved a structured proforma, and diagnostic interventions encompassed Ultrasonography, Hysteroscopy, and Endometrial sampling. Statistical analysis employed various measures, including the concordance index and Chi-square test, utilizing SPSS 21.
Results: This hospital-based study enrolled 126 women presenting with abnormal uterine bleeding (AUB), offering comprehensive insights into their demographic, clinical, and histopathological profiles. The mean age of the cohort was 45.96 years, with a notable concentration in the 40-44.99 age group. The majority resided in urban areas (96.83%) and belonged to the upper middle class (65.87%), with housewives constituting 97.62%. AUB patterns, including irregular bleeding (56.35%) and postmenopausal bleeding (15.87%), were meticulously examined. Comorbidities, predominantly hypertension (31 patients) and hypothyroidism (22 patients), were identified in 60 patients. Ultrasonography revealed Leiomyoma in 54.76% and Adenomyosis in 24.6%. Clinical diagnoses, utilizing the PALM-COEIN classification, highlighted AUB-L as the primary cause (54.76%). Diagnostic modalities such as Hysteroscopy, Hysterectomy, and concordance analyses contributed to enhanced diagnostic precision, emphasizing the multidimensional approach imperative for effective AUB management in clinical practice.
Conclusion: Our study underscores the efficacy of the PALM-COEIN classification in correlating clinical and histopathological findings for Abnormal Uterine Bleeding (AUB). Leiomyoma emerged as the primary etiology, showcasing the classification's utility in identifying dual pathologies. Histopathological examination significantly complemented clinical diagnoses, emphasizing the system's value in optimizing patient care.

Keywords: Abnormal Uterine Bleeding (AUB), PALM-COEIN classification, Diagnostic modalities, Perimenopausal women

Introduction

Abnormal uterine bleeding (AUB) is characterized by irregular, voluminous, frequent, or prolonged bleeding from the uterine corpus, excluding pregnancy [1]. This condition, prevalent among perimenopausal women, not only leads to physical and mental distress but also places a substantial financial burden on affected individuals [2]. Constituting more than 70% of gynecological consultations during the perimenopausal and postmenopausal years, AUB accounts for 35% of Gynecology OPD visits and 25% of gynecological surgeries [3]. Its prominence during the 2-8 years preceding menopause underscores the need for comprehensive understanding and effective management [4].

While the International Federation of Gynecology and Obstetrics (FIGO) has introduced the PALM-COEIN classification to categorize AUB causes, incorporating structural (PALM) and functional (COEIN) elements, there remains a gap in correlating clinical presentations with histopathological findings [4]. Acute AUB, necessitating immediate intervention, and chronic

AUB, persisting for the majority of the last 6 months, further complicate the diagnostic landscape [5]. The potential severity of underlying causes, ranging from physiological processes to possible malignancies, underscores the importance of accurate identification through minimally invasive means.

Diagnostic modalities, such as Ultrasonography, Hysteroscopy, and Endometrial sampling, play pivotal roles in discerning structural and functional causes of AUB. Ultrasonography, as a primary diagnostic tool, aids in detecting uterine abnormalities, while Hysteroscopy allows direct visualization and treatment in a single session. Endometrial sampling, a simple OPD procedure, effectively rules out malignancy. The historical reliance on Dilatation and Curettage (D and C) for endometrial sampling has diminished due to associated risks, expenses, and the availability of less invasive alternatives [6]. Despite advancements, diagnosing AUB remains challenging, prompting the need for a comprehensive study to bridge the clinical-histopathological gap.

This study seeks to address the existing knowledge gaps by correlating clinical findings with histopathological insights in AUB, employing the PALM-COEIN classification. The overarching aim is to enhance diagnostic precision, particularly in cases where conventional methods may fall short. By elucidating these connections, we aspire to contribute to the refinement of AUB management strategies, ultimately improving patient outcomes.

Materials and Methods

Study Design

This descriptive study was done which investigated Abnormal Uterine Bleeding (AUB) in women aged 35 and above who presented to our hospital, from September 2019 to February 2021.

Inclusion criteria

1. Women of age 35 years and above.
2. Patients having heavy menstrual bleeding.
3. Frequent cycles.
4. Frequent and heavy menstrual bleeding.
5. Intermenstrual bleeding.
6. Post-menopausal bleeding.

Exclusion criteria

1. Vaginal bleeding related to pregnancy.
2. Pelvic inflammatory disease.
3. Genital prolapse.
4. Hormone therapy.
5. IUCD insertion.

Sample size

The sample size was calculated using the formula $n=z^2\alpha \times P \times (Q)/d^2$. In this study, Pearson coefficient, commonly used for correlation studies, was deemed inapplicable due to the categorical nature of variables. Utilizing assumptions with a likelihood value (P) of 0.09, margin of error (d) of 0.05, and a standard normal variate (z) of 1.96, the sample size was determined to be 126.

Sample technique

The sampling technique used was non-probabilistic sampling method of purposive sampling where all the patients attending to the Department of Obstetrics and Gynecology (OPD and IPD), of our hospital from 1st September 2019 to 28th February 2021 (18 months), with complaints of AUB, were screened as per inclusion and exclusion criteria and subsequently included or excluded from the study.

Data Collection

Data collection for this study was conducted by the observer, using a designated study proforma. Prior to participation, eligible women were briefed about the study in their local vernacular language, and informed consent was obtained through a pre-approved proforma sanctioned by our ethical committee. Participants were explicitly granted the freedom to withdraw from the study at any stage.

Methods

This descriptive study was executed within the Obstetrics and Gynecology department at our hospital, involving 126 patients diagnosed with Abnormal Uterine Bleeding (AUB) who met the predetermined inclusion criteria. Prior to the commencement of the study, informed written consent was meticulously obtained from all participants, and ethical approval from the institutional review committee was secured.

A comprehensive medical history, encompassing chief complaints, history of present illness, demographic details, detailed menstrual history, obstetric history, past medical and surgical history, and personal history, was systematically documented. Subsequent to this, a thorough general physical examination, with a specific focus on identifying features of anemia, was conducted.

Vital signs, including pulse, blood pressure, respiratory rate, and temperature, were recorded, and a systemic examination covering cardiovascular, respiratory, and per abdomen aspects was undertaken. Pelvic examinations, incorporating local examination, per speculum, and bimanual pelvic examination, were meticulously performed.

The investigative phase comprised a set of routine examinations, including Complete Blood Count (CBC), Urine Routine/Microscopy, ABORh, Random Blood Sugar (RBS), Thyroid Stimulating Hormone (TSH), Coagulation profile (aPTT, PTINR), viral markers, PAP smear, and Ultrasonography (TAS - 3-5 MHZ, TVS - 5-7.5 MHZ). Ultrasonography was conducted using the E soate Ultrasound Machine. Additional investigations, such as X-ray and ECG, were implemented when deemed necessary.

Upon establishing a provisional diagnosis, patients underwent either Dilatation and Curettage / Endometrial sampling or Hysteroscopic evaluation. Tissue obtained was systematically subjected to histopathological examination. For patients undergoing Hysterectomy (open/laparoscopic), specimens comprising the uterus, cervix, and ovaries were sent for macroscopic and histopathological examination.

All findings were meticulously correlated with the PALM-COEIN classification system, encompassing categories such as AUB-P, AUB-A, AUB-L, AUB-M, AUB-C, AUB-O, AUB-E, AUB-I, and AUB-N. Subsequently, statistical analyses were performed to discern patterns and associations within these classifications, thereby contributing to a comprehensive understanding of Abnormal Uterine Bleeding in this cohort.

Statistical Analysis

The statistical analysis encompassed a comprehensive examination of the data, employing various measures to elucidate the characteristics of the study cohort. Descriptive statistics, including range, mean ± standard deviation (± SD), frequencies (number of cases), and relative frequencies (percentages) were meticulously calculated as deemed

appropriate for each variable. To compare categorical data, the analysis incorporated concordance measures, including the concordance index and Chi-square (χ^2) test when applicable. Concordance, indicative of the agreement rate between two variables, was assessed through the concordance index, a metric evaluating the predictions made by the algorithm. The Concordance Index values were categorized based on their strength of correlation (>0.20: Poor, 0.21–0.40: Fair, 0.41–0.60: Moderate, 0.61–0.80: Good, 0.81–1.0: Very good). In instances where expected frequencies were less than 5, the Fisher exact test was employed. A probability value (p-value) less than 0.05 was deemed statistically significant. All statistical computations were meticulously conducted using the Statistical Package for the Social Science (SPSS) 21 version, a widely recognized statistical program for Microsoft Windows developed by SPSS Inc. in Chicago, IL, USA.

Results

The present study, conducted at our hospital, focused on 126 women presenting with abnormal uterine bleeding, yielding valuable insights into various aspects of their demographic, clinical, and histopathological profiles.

The mean age of the study population was 45.96 years, with a notable concentration in the age group of 40-44.99 years. Regarding parity, the majority of subjects were Para 2, constituting 63.49%. Urban residency was predominant, with 96.83% of subjects residing in urban areas. In terms of socioeconomic status, the study found that 65.87% belonged to the upper middle class. Additionally, an overwhelming majority of the participants, 97.62%, were housewives. Obesity and overweight were observed in 14.28% and 26.98% of subjects, respectively. (Table 1)

Predominantly, irregular menstrual bleeding was identified as the primary concern, with a noteworthy emphasis on Heavy Menstrual Bleeding (HMB), observed in 56.35% of subjects. Postmenopausal bleeding, accounting for 15.87% of cases, was also a significant aspect of the AUB spectrum. A nuanced analysis revealed that 49.3% of participants experiencing HMB endured it for 6-12 months. For those with postmenopausal bleeding, 40% reported a duration of 10-30 days, while another 40% encountered bleeding for 30.1-6 months. This study further elucidated additional AUB patterns, including Heavy and Prolonged Menstrual Bleeding (9.52%), Prolonged Menstrual Bleeding and Frequent Cycles (6.35% each), and the less common pattern of Frequent and Heavy Menstrual Bleeding (5.56% of subjects). The detailed exploration of these AUB patterns contributes valuable insights to the existing body of medical knowledge, providing a comprehensive understanding of the diverse presentations of abnormal uterine bleeding. (Table 2)

The investigation involved 60 patients, among whom hypertension (31 patients) and hypothyroidism (22 patients) were the predominant comorbidities. A subset of patients (7 cases) had undergone previous gynecological surgeries, with tubectomy being the most common procedure (5 patients). The study provides a thorough examination of comorbidity prevalence, highlighting hypertension as the most prevalent medical disorder, followed by hypothyroidism and diabetes mellitus. A substantial proportion (52.38%) of patients exhibited no comorbidities, while 35.71% had a single comorbidity, and 11.9% presented with multiple comorbidities. Among the participants, 26 had a history of surgical procedures, with 7 undergoing gynecological surgeries, primarily tubectomy. General surgical interventions included cholecystectomy (11 patients), appendicectomy (3 patients), and various others such as hemorrhoidectomy, hernia operation, breast lump excision, craniotomy, and VP shunt, each observed in 1 patient. This in-depth analysis sheds light on the spectrum of comorbidities and surgical histories within the patient population under study. (Table 3)

In the present study, abdominal examination revealed that 78.57% of subjects had a non-palpable uterus, with 10.3%, 4.76%, 3.96%, and 2.38% exhibiting palpable uteri of 12-14 weeks, 14.1-16 weeks, 16.1-18 weeks, and >18 weeks sizes, respectively. Pelvic examination, including per speculum examination, identified various cervical conditions, such as a healthy cervix in 65.08% of subjects, along with hypertrophy, chronic cervicitis, erosion, polyps, atrophy, and growth in smaller percentages. Bimanual pelvic examination indicated diverse uterine sizes, ranging from normal to atrophic, with specific percentages corresponding to each size category. (Table 4)

On ultrasound (USG), 54.76% of subjects exhibited Leiomyoma, and 24.6% showed Adenomyosis. Additionally, Endometrial Hyperplasia was detected in 17.46% of cases, Endometrial Polyp in 16.66%, Endocervical Polyp in 6.35%, Endometrial Carcinoma in 1.59%, and Cervical Carcinoma in 0.79%. Clinically, Leiomyoma was identified as the predominant cause of Abnormal Uterine Bleeding, primarily diagnosed through ultrasonography. (Table 5)

Clinical provisional diagnoses were established through the correlation of clinical history, examinations, and ultrasound (USG) findings, with PALM-COEIN classification guiding the categorization. AUB-L emerged as the predominant clinical diagnosis, affecting 54.76% of subjects, followed by AUB-A (24.6%), AUB-P (23.01%), and AUB-M (19.84%). Notably, no subjects exhibited components of COEIN as the cause of AUB in our study. Endometrial pathology was determined through endometrial curettings, collected via Hysteroscopy, Pipelle's biopsy, or Dilatation and Curettage (D&C). Among the 39 subjects who underwent hysteroscopy, two necessitated subsequent hysterectomy due to confirmed endometrial carcinoma, while the remaining 37 subjects recovered through hysteroscopic interventions. Proliferative pattern emerged as the prevailing endometrial pattern in our study, evident in 64.11% of subjects on Hysteroscopic curettings and 67.74% on Pipelle's biopsy. The study underscores the diagnostic significance of histopathological evaluations in refining clinical diagnoses and optimizing treatment decisions. (Table 6, 7)

In the study, Hysteroscopy was performed in 30.95% of subjects, Hysterectomy in 66.66%, Myomectomy in 3.17%, and Cervical biopsy in 0.79% of subjects. Among the total 126 subjects, 29.3% underwent Hysteroscopy only, 1.58% had both Hysteroscopy and Hysterectomy, 24.6% underwent Pipelle‟s biopsy and Hysterectomy, 0.79% underwent D&C and Hysterectomy, 39.68% directly underwent Hysterectomy, and 3.17% had Laparoscopic myomectomy. One subject was diagnosed with cervical carcinoma on cervical biopsy and was advised Radiotherapy and Chemotherapy.

Regarding Hysteroscopy, out of 39 subjects, 2 underwent hysterectomy due to proven endometrial carcinoma in hysteroscopic curettings, while the remaining 37 subjects recovered after Hysteroscopic polypectomy (30), myomectomy (2), or curettage (5). USG diagnosed polyps in 29 subjects, and Hysteroscopy confirmed polyps in 25 subjects. In one case, USG misdiagnosed endometrial hyperplasia as a polyp, and in three cases (2 with polyp and leiomyoma, 1 with polyp and adenomyosis), subjects directly underwent Hysterectomy due to

multiple causes. Hysteroscopy detected polyps in 30 subjects, consistent with USG findings in 25 subjects, while in the remaining 5 cases, USG misdiagnosed polyps as endometrial hyperplasia, later confirmed as polyps on Hysteroscopy. (Table 8)

In the context of Hysterectomy, out of 84 subjects, 34 had prior endometrial sampling, and the remaining 50 underwent direct Hysterectomy as they did not provide consent for endometrial sampling. (Table 8)

In the operative findings, Leiomyoma was the predominant pathology observed in 67 subjects, followed by Adenomyosis in 41 subjects, Endometrial Polyp in 24 subjects, Endocervical Polyp in 8 subjects, Endometrial Hyperplasia in 10 subjects, and Bulky uterus in 5 subjects where no other structural abnormalities were detected grossly. On histopathology, Leiomyoma remained the most prevalent pathology in 67 subjects, followed by Adenomyosis in 46 subjects, Endometrial Polyp in 30 subjects, and Endocervical polyp in 8 subjects. Additionally, Endometrial Hyperplasia was identified in 15 subjects, endometrial carcinoma in 4 subjects, CIN in 3 subjects, and cervical cancer in 1 subject. The proliferative phase emerged as the most common endometrial pattern in 83 subjects, followed by the secretory phase in 15 subjects, and atrophic endometrium in 4 subjects. In 121 subjects, the proliferative pattern prevailed as the most common endometrial pattern in 68.6%, while the secretory and endometrial hyperplasia patterns were observed in 12.4% each, and atrophic and endometrial carcinoma in 3.3% each. (Table 9)

In our study, the final diagnosis, based on histopathology reports and following the PALM-COEIN classification, revealed that AUB-L was the predominant cause of abnormal uterine bleeding (AUB), accounting for 53.17% of subjects, followed by AUB-A in 36.5%, AUB-P in 30.15%, and AUB-M in 15.87% of subjects. Among AUB-M cases, Simple Hyperplasia without atypia was the most frequent finding (50%), followed by Malignancy (25%), with four cases of endometrial carcinoma and one case of cervical cancer.

In terms of clinical diagnosis, 78.57% had a single identified cause of AUB, with AUB-L being the most common (38.09%), followed by AUB-P (17.46%), AUB-A (10.31%), and AUB-M (12.70%). Multiple causes were observed in 21.43% of cases, with AUB-A, L being the most common (10.31%). Regarding histopathological analysis, 69.04% of subjects exhibited a single PALM component, with Leiomyoma being the most common (25.4%), followed by Polyp (21.43%), Hyperplasia/Malignancy (11.9%), and Adenomyosis (10.31%). Multifactorial cases included Adenomyosis and Leiomyoma (20.63%), Leiomyoma and Polyp (1.59%), Polyp and Hyperplasia/Malignancy (2.38%), Leiomyoma and Hyperplasia/Malignancy, Polyp and Adenomyosis (0.79% each), Adenomyosis, Leiomyoma, and Malignancy/Hyperplasia (0.79%), and Polyp, Adenomyosis, and Leiomyoma together (3.97%). (Table 10)

Discussion

Abnormal uterine bleeding is defined as any bleeding from the genital tract, which is a deviation from the normal in volume, duration, regularity or frequency. In present study, 126 women with AUB were examined in Obstetrics and Gynecology department. A detailed history, clinical examination and routine investigations were done. USG was offered as initial non-invasive investigation. Further evaluation was done by endometrial curettage, either by Dilatation and Curettage, Pipelle's biopsy or Hysteroscopy. In subjects who did not give consent for endometrial curettage, they were subjected directly to major surgery (Myomectomy / Hysterectomy). And for remaining subjects, further intervention was done as per the endometrial histopathology. Various parameters of our study were compared with studies of different authors.

In our study, the mean age of participants was 45.96 years, aligning with the findings of Suseela T L *et al.* [7]. Regarding parity distribution, 80% of women in our study were multiparous, a result consistent with studies by Mohammed N *et al.* [8], Lotha L *et al.* [3], and Snehkiran *et al.* [9]. Body Mass Index (BMI) was assessed in our study and compared with the research of Sajitha *et al.* [10] (2014) and Mishra D *et al.* [4] (2017). Mishra D *et al.* [4] reported obesity in 9.3% of women, while Sajitha *et al.* [10] found 3.8% to be obese. In our cohort of 126 women, 14.28% were classified as obese, demonstrating similarity to the findings of Mishra D *et al.* [4]. This correspondence underscores the consistency of BMI results between our study and Mishra D *et al.* [4].

It was found that, Heavy Menstrual Bleeding (HMB) was prevalent in 56.35% of subjects, aligning with findings in studies by Bashir H *et al.* [11] and Khan R *et al.* [12]. Regarding PAP smear results, our study demonstrated normal findings in 85.71% of cases, comparable to the 96% normalcy reported in the study by Mahapatra M *et al.* [13].

In our study, the provisional diagnosis was established by integrating clinical history, examination, and ultrasound (USG) findings. Sudhamani S *et al.* [14] reported AUB-L in 28% of subjects, AUB-M in 18%, AUB-A in 5%, and AUB-P in 3%. Similarly, Mishra D *et al.* [4] found AUB-L in 41.1% of subjects, followed by AUB-A, AUB-P, and AUB-M. Misra B *et al.* [15] reported AUB-L in 48.25%, AUB-A in 25.75%, and AUB-P and AUB-M in 4.25% each. In our study, AUB-L was the most prevalent, observed in 54.76% of 126 subjects, followed by AUB-A in 24.6%, AUB-P in 23.01%, and AUB-M in 19.84%. Our clinical diagnosis aligns with Sudhamani S *et al.* [14], Mishra D *et al.* [4], and Misra B *et al.* [15], emphasizing AUB-L as the most common diagnosis.

Regarding endometrial patterns, our study obtained curettings from 121 subjects via Pipelle's biopsy, D&C, Hysteroscopy, and Hysterectomy. Proliferative patterns were prevalent in 67.74% of subjects in our study, akin to findings in studies by Banale M *et al.* [16], Suneet K *et al.* [17], and Maurya MK *et al.* [18], where proliferative patterns accounted for 32.63%, 36%, and 30.6% of subjects, respectively. Thus, the proliferative pattern observed in our study is consistent with previous literature [16-18].

In Hysteroscopic curettage, the proliferative endometrial pattern was identified as the most common pattern in studies by Afghan S *et al.* [19] (34.6%) and Mahapatra M *et al.* [13] (45.7%). Our 2021 study found a maximum proliferative pattern in 64.11% of subjects, aligning with Afghan S *et al.* [19] and Mahapatra M *et al.* [13].

Regarding Hysterectomy specimens, Khushnood M *et al.* [20] reported proliferative patterns as the most prevalent, constituting 53%. In our 2021 study, a maximum proliferative pattern was observed in 74% of subjects, consistent with Khushnood M *et al.* [20].

Of the 126 subjects, AUB-L was identified as the most common histopathological diagnosis in 53.17% of subjects, followed by AUB-A (36.5%), AUB-P (30.15%), and AUB-M (15.87%). This HPE diagnosis aligns with Neena Y *et al.* [21], Mohammed N *et al.* [8], Mandal SK *et al.* [22], Mishra D *et al.* [4], and Misra B *et al.* [15] studies, where AUB-L consistently emerged as the predominant HPE diagnosis.

For the AUB-M component, our study revealed a prevalence of 15.87%, a finding comparable to the study conducted by Misra

B *et al*. [15]. The distribution of AUB-M, our study reported that Simple hyperplasia without atypia was the most common subtype, observed in 50% of subjects. This prevalence corresponds with the findings of Misra B *et al*. [15], where Simple hyperplasia without atypia accounted for 44.11%.

the clinicopathological correlation was highest in subjects with AUB-L, followed by AUB-M, then AUB-P, with the least correlation observed in subjects with AUB-A. This pattern aligns with findings from Mishra D *et al*. [4] and Misra B *et al*. [15] studies, where AUB-L exhibited the highest clinicopathological correlation, consistent with our present study. Similar to Misra B *et al*. [15] and Mishra D *et al*. [4] studies, AUB-A demonstrated the least clinicopathological correlation in our investigation.

We observed a statistically significant difference ($p< 0.05$) in the clinical and histopathological diagnosis of AUB-A in our study, both when counted alone and in combination with other PALM component pathologies, a result comparable to Mishra D *et al*. [4]. Furthermore, the significant p-value in the clinical and histopathological diagnosis of the combination of AUB-A, L mirrors findings in the Mishra D *et al*. [4] study.

Our study highlighted that perimenopausal women, presenting with heavy menstrual bleeding, were predominantly affected. The primary etiology of AUB was clinically and histopathologically identified as Leiomyoma. Adenomyosis was better diagnosed on histopathological examination, underscoring the significance of HPE in its detection. We observed good clinicopathological correlation for AUB-P, AUB-L, and AUB-M, while histopathological examination revealed cases of AUB-A that were missed clinically. This underscores the gold standard status of HPE in AUB diagnosis.

Table 1: Age distribution, demographic profile, and BMI distribution

Age (Yrs)	**No. of Subjects**	**Percentage**
35-39.99	18	14.29%
40-44.99	40	31.75%
45-49.99	36	28.57%
50-54.99	18	14.29%
55-59.99	9	7.14%
> 60	5	3.97%
Total Age Distribution	126	100%
Demographic Parameters	**No. of Subjects**	**Percentage**
Rural/Urban		
Rural	4	3.17%
Urban	122	96.83%
Religion		
Hindu	58	46.03%
Sikh	67	53.17%
Muslim	1	0.79%
Occupation		
Housewife	123	97.62%
Employed	3	2.38%
Socioeconomic Status		
UMC (Upper Middle Class)	83	65.87%
MC (Middle Class)	43	34.13%
Total Demographic Profile	126	100%
BMI	**No. of Subjects**	**Percentage**
Normal	74	58.73%
Overweight	34	26.98%
Obese	18	14.28%
Total BMI Distribution	126	100%
Parity	**No. of Subjects**	**Percentage**
0	1	0.79%
1	15	11.90%
2	80	63.49%
3	22	17.46%
>3	8	6.35%
Total	126	100%

Table 2: Abnormal uterine bleeding and parity

Abnormal Uterine Bleeding	**No. of Subjects**	**Percentage**
Heavy Menstrual Bleeding	71	56.35%
Prolonged Menstrual Bleeding	8	6.35%
Heavy and Prolonged Menstrual Bleeding	12	9.52%
Frequent Cycles	8	6.35%
Frequent and Heavy Menstrual Bleeding	7	5.56%
Postmenopausal Bleeding	20	15.87%
Total	126	100%

Table 3: Comorbidities and Previous Gynecological Surgery

Comorbidities	**No. of subjects**	**Percentage (%)**
No comorbidity	66	52.38%
Single	45	35.71%
Multiple	15	11.90%
Total	126	100%
Gynecological Surgery	**No. of subjects**	**Percentage**
Tubectomy	5	71.42%
Salpingectomy	1	14.28%
Hysteroscopic Polypectomy	1	14.28%
Total	7	100%

Table 4: Abdominal and pelvic examination findings

Abdominal and Pelvic Examination	**No. of Subjects**	**Percentage (%)**
Uterus palpable in weeks		
Not palpable	99	78.57%
12-14 weeks	13	10.31%
14.1-16 weeks	6	4.76%
16.1-18 weeks	5	3.96%
>18 weeks	3	2.38%
Total	126	100%
Per speculum findings	**No. of Subjects**	**Percentage (%)**
Healthy cervix	82	65.08%
Cx Hypertrophied	12	9.52%
Cervical erosion	8	6.35%
Cervical polyp	6	4.76%
Chronic cervicitis	12	9.52%
Cx atrophic	5	3.97%
Cx growth	1	0.79%
Total	126	100%
Size of uterus	**No. of Subjects**	**Percentage (%)**
Normal	24	19.05%
<8 weeks	16	12.69%
8-10 weeks	51	40.47%
10.1-12 weeks	11	8.73%
12.1-14 weeks	7	5.56%
14.1-16 weeks	6	4.76%
16.1-18 weeks	5	3.97%
>18 weeks	3	2.38%
Atrophic	3	2.38%
Total	126	100%

Table 5: USG findings

USG findings	**No. of subjects**	**Percentage (%)**
Leiomyoma	69	54.76%
Adenomyosis	31	24.60%
Endometrial Hyperplasia	22	17.46%
Endometrial polyp	21	16.66%
Endocervical polyp	8	6.35%
Endometrial carcinoma	2	1.59%
Cervical carcinoma	1	0.79%

Table 6: Provisional diagnosis and endometrial curettings

Provisional Diagnosis	**No. of subjects**	**Percentage (%)**
AUB-P	29	23.01
AUB-A	31	24.6
AUB-L	69	54.76
AUB-M	25	19.84
COEIN	0	0
Endometrial Curettings		
Procedure (No. of subjects)	**Hysterectomy done**	**Hysterectomy not done**
Hysteroscopy (39)	2	37
Pipelle's Biopsy (31)	31	0
Dilatation and Curettage (1)	1	0

Table 7: Pattern of endometrium

Endometrial Pattern	Endometrial curettings					
	Hysteroscopy (n = 39)		Pipelle's Biopsy (n = 31)		D&C (n = 1)	
	No.	%	No.	%	No.	%
Proliferative	25	64.11%	21	67.74%	0	0%
Secretory	3	7.69%	4	12.90%	0	0%
Simple hyperplasia without atypia	6	15.38%	3	9.68%	0	0%
Simple hyperplasia with atypia	0	0%	1	3.23%	1	100%
Complex hyperplasia without atypia	1	2.56%	0	0%	0	0%
Complex hyperplasia with atypia	0	0%	0	0%	0	0%
Atrophic	2	5.13%	0	0%	0	0%
Endometrial ca	2	5.13%	2	6.45%	0	0%

Table 8: Hysteroscopy and Hysterectomy

Hysteroscopy	No. of subjects
Hysteroscopic Polypectomy	30
Hysteroscopic Myomectomy	2
Hysteroscopic Curettings	5
Hysteroscopy and Hysterectomy	2
Total	39
Hysterectomy	**No. of subjects**
Hysteroscopy and Hysterectomy	2
D&C and Hysterectomy	1
Pipelle's Biopsy and Hysterectomy	31
Direct Hysterectomy	50
Total	84

Table 9: Showing operative findings, HPE and Endometrial Pattern

Operative Findings	No. of Subjects
Leiomyoma	67
Adenomyosis	41
Bulky Uterus	5
Endometrial Polyp	24
Endocervical Polyp	8
Endometrial Hyperplasia	10
HPE (Histopathology)	**No. of Subjects**
Leiomyoma	67
Adenomyosis	46
Endometrial Polyp	30
Endocervical Polyp	8
Endometrial Hyperplasia	15
Endometrial Carcinoma	4
Atrophic	4
CIN	3
Cervical Cancer	1
Endometrial Pattern	**No. of Subjects**
Proliferative	83
Secretory	15
Endometrial Hyperplasia	15
Atrophic	4
Endometrial Carcinoma	4
Total	121

Table 10: Distribution of cases as per clinical diagnosis and histopathology

Clinical Diagnosis		No. of Subjects	Percentage
	AUB-P	22	17.46%
	AUB-A	13	10.31%
	AUB-L	48	38.09%
Single factor	AUB-M	16	12.70%
	AUB-P, A	3	2.38%
	AUB-P, L	2	1.59%
	AUB-P, M	2	1.59%
	AUB-A, L	13	10.31%
Multiple factors	AUB-A, M	1	0.79%
	AUB-L, M	5	3.97%

	AUB-A, L, M	1	0.79%
	AUB-P, A, L	0	0%
Total		126	100%
Histopathological Diagnosis		**No. of Subjects**	**Percentage**
	AUB-P	27	21.43%
	AUB-A	13	10.31%
Single factor	AUB-L	32	25.40%
	AUB-M	15	11.90%
	AUB-P, A	1	0.79%
	AUB-P, L	2	1.59%
	AUB-P, M	3	2.38%
	AUB-A, L	26	20.63%
	AUB-A, M	0	0%
Multi factorial	AUB-L, M	1	0.79%
	AUB-A, L, M	1	0.79%
	AUB-P, A, L	5	3.97%
Total		126	100%

Conclusion

In conclusion, our study demonstrated a robust clinicopathological correlation when employing the PALM-COEIN classification system. Notably, Leiomyoma emerged as the predominant etiology contributing to Abnormal Uterine Bleeding (AUB) in the perimenopausal age group. The inclusion of multiple etiologies in this classification facilitated the identification of dual pathologies, such as AUB-A, L, and AUB-A, P in our investigation. Histopathological examination proved indispensable in accurately diagnosing cases overlooked clinically. Therefore, we assert that the PALM-COEIN classification system is a valuable tool, serving both clinical and histopathological aspects, with mutual complementarity. Proper categorization within this system aids in optimizing patient treatment.

In the context of AUB-A, a significant ($p< 0.05$) disparity between clinical and histopathological diagnoses was noted. This discrepancy is attributed to the similarity in symptoms and signs between adenomyosis and leiomyoma, making clinical differentiation challenging. Our study further emphasized the significance of histological examination as a complementary diagnostic tool, particularly evident in the highly significant ($p< 0.03$) clinical and histopathological diagnosis of the AUB-A, L combination within the PALM component of AUB.

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Conflict of Interest

Not available

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Not available

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