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Original Research Article

Evaluation of PALM - COEIN classification and management of abnormal uterine bleeding in peri-menopausal age group

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a prevalent condition affecting a significant portion of women, particularly in the perimenopausal age group. The FIGO PALM-COEIN classification system, introduced in 2011, categorizes AUB based on its etiology and is a useful tool in diagnosing and managing AUB. The aim of the study was to evaluate the clinical and histopathological outcomes of AUB diagnoses in women based on this classification.

Methods: A 6-month retrospective study was conducted in a tertiary care teaching hospital in western India, including 80 perimenopausal women, presenting with AUB between July and December 2024. Patients were assessed using clinical history, physical examination, and imaging. Additional diagnostic modalities like hysteroscopy and MRI were employed when necessary. Treatment outcomes were analyzed, focusing on medical and surgical interventions.

Results: The majority of patients were in the 40-45 years age group (60%), with heavy menstrual bleeding (77.50%) being the most common bleeding pattern. Ultrasonography identified leiomyoma (38.75%) and adenomyosis (28.75%) as the most frequent causes. Histopathological examination of hysterectomy specimens revealed leiomyoma (45.58%), adenomyosis (30.90%), and endometrial hyperplasia (14.70%). Hysterectomy was the most common final treatment modality (85%).

Conclusions: The PALM-COEIN classification system is a valuable, efficient tool for diagnosing AUB, facilitating targeted treatment strategies. Transvaginal ultrasonography remains the first-line imaging modality, but histopathological examination of all surgical specimens is essential to ensure comprehensive diagnosis and optimal management. Medical hormonal therapy is effective in most cases, but surgical options, including hysterectomy, remain crucial for definitive treatment.

Keywords: Abnormal uterine bleeding, intermenstrual bleeding, Leiomyoma, Adenomyosis, Endometrial hyperplasia, Evaluation of PALM-COEIN classification

INTRODUCTION

Abnormal uterine bleeding (AUB) is the most common presenting complaint of most gynecological patients in the outpatient department. Approximately 14-25% women experience AUB during their lifetime.¹ AUB can occur at any age and has a variety of presentations. Upto 33% of females seek medical assistance for this problem during their reproductive or perimenopausal age. In 2011, the

menstrual disorders group (FMDG) of the International Federation of Gynecology and Obstetrics (FIGO) published a new classification system based on the etiology of pathological uterine bleeding, PALM - COEIN classification.^{2,3}

AUB is defined as bleeding pattern that is not consistent with normal menstrual cycle parameters (frequency, regularity, duration, and volume). AUB can be acute or chronic, chronic AUB is bleeding that is abnormal in

duration, volume, and/or frequency and has been present for more than the last 6 months, whereas acute uterine bleeding is extensive uterine bleeding that requires medical intervention to stop bleeding.⁴

Excessive menstrual blood loss often interferes with the women's physical, social, emotional, and mental quality of life irrespective of regularity, frequency, and duration of the menstrual cycle.⁵ It is a major psychological setback for the perimenopausal age group women as it disturbs her normal routine.⁶

There are a variety of methods for evaluation and diagnosis of AUB. Ideally appropriate diagnosis should be established before proceeding for management. The diagnosis should be established by cheapest, least invasive as well as effective method. Objective measurements of volume are usually the standard and a pictorial blood-loss assessment chart (PBAC) scores are now not recommended in routine clinical practice. Transvaginal ultrasonography (TVUS) (sensitivity 79%, specificity 45.8%) is the first investigation/ imaging diagnostic method used for AUB, sonohysterography (SHG) is a more accurate diagnostic modality than TVUS (sensitivity 95.1%, specificity 83.3%). Hysteroscopy - a procedure in which the uterine cavity is directly visualized via an endoscope introduced via vagina and simultaneously endometrial or endocervical tissue samples can also be taken is not the first investigation to be preferred despite its high sensitivity (91.9%) and specificity (86.5%) because it is expensive and invasive.⁷

The aim of the present study was to evaluate the outcomes of clinical and histopathological diagnoses in women with AUB according to PALM-COEIN classification.

METHODS

This was a retrospective study of 80 women diagnosed as AUB of perimenopausal age group carried out in the Department of Obstetrics and Gynecology at SVP hospital a tertiary care teaching institute in western India between July 2024 and December 2024.

Our institute drains patients from urban, semi-urban and nearby rural areas. After due permission from the authority, computerized records using Microsoft excel of all the women who presented to the OPD with complaints of heavy menstrual bleeding and/or intermenstrual bleeding and patients who were admitted for the management of AUB were studied.

History, clinical features, vital data and general, per abdominal, per speculum and per vaginal examination findings of these women were noted, they were subjected to pelvic ultrasonography (TAS and/or TVS), other diagnostic modalities were used as and when required. Past history of any pelvic pathology, pelvic surgery or treatment taken for infertility is also taken into account.

Analysis was done regarding their diagnosis and management.

Inclusion criteria

Women aged 40 years and above with complaints of heavy menstrual bleeding and intermenstrual bleeding were included.

Exclusion criteria

Women who were pregnant and had post-menopausal bleeding were excluded.

RESULTS

The maximum number of patients (48) were in the 40-45 years age group, 21 patients were in the 46-50 years age group and 11 patients were >50 years in age. Increased incidence of AUB in this age group is due to the fact that these women are in their climacteric period approaching menopause, when cycles become intermittently anovulatory due to a decline in the number of ovarian follicles and estradiol level.⁹

The incidence of AUB was found to be maximum in para 2 women 36 (45%) and least in nulliparous women 3 (3.75%), which is comparable to a study done in South India by Sreelaxmi et al in 2017.¹⁰

As per pattern of bleeding, AUB is classified by FIGO as (a) abnormal uterine bleeding with heavy menstrual bleeding (AUB/HMB); (b) abnormal uterine bleeding with bleeding between periods (AUB/IMB).

Majority of patients 62 (77.5%) presented with complaints of heavy menstrual bleeding and 18 (22.5%) patients had intermenstrual bleeding.

Ultrasonography was the primary imaging modality used to assess all the patients, in most patient's transvaginal probe was used and transabdominal probe was used if needed. It gave primary diagnosis for 69 patients, remaining 11 patients required other diagnostic modalities like MRI and hysteroscopy.

Patients with ultrasonography findings suggestive of polyp were advised hysteroscopy was served as diagnostic as well as therapeutic tool and patients with large and/or multiple leiomyoma or advanced changes of adenomyosis were advised MRI for precise lesion mapping which in turn helped to decide whether to directly opt for hysterectomy or not.

Primary treatment modality was individualized for each patient depending upon the contributing factor or etiology of their symptoms of AUB. Patients who were not relieved of the symptoms with primary treatment other than hysterectomy were offered other treatment modalities as per their individual factors.

Hysterectomy was the final treatment modality for 68 patients, 33 patients underwent hysterectomy as primary treatment modality and for the rest of the patients hysterectomy was done as a result of failure of other treatment modalities.

Out of the patients who underwent hysterectomy, maximum patients had leiomyoma 23 (33.82%), followed by adenomyosis 21 (30.9%). 1 (1.47%) patient had endometrial metaplasia as histopathological diagnosis.

Table 1: Age wise distribution in AUB.

Age (years)	N (%) (n=80)	Nicole et al, 2015 (n=103) ⁸ (%)
40-45	48 (60)	67.97
46-50	21 (26.25)	23
>50	11 (13.75)	10

Table 2: Parity wise distribution.

Parity	N (%) (n=80)	Sreelaxmi et al, 2015 (n=135) ¹⁰ (%)
Nulligravida	3 (3.75)	05 (3.70)
Para-1	10 (12.5)	05 (3.70)
Para-2	36 (45)	70 (51.85)
Para-3	16 (20)	39 (28.88)
Para-4	10 (12.5)	12 (8.88)

Table 3: Pattern of bleeding.

Pattern of bleeding	Number of patients (n=80) N (%)
Heavy menstrual bleeding (HMB)	62 (77.5)
Intermenstrual bleeding (IMB)	18 (22.5)

Table 4: Ultrasonography findings.

USG findings	Number of patients (n=80) N (%)
Leiomyoma (AUB-L)	31 (38.75)
Adenomyosis (AUB-A)	23 (28.75)
Polyp (AUB-P)	5 (6.26)
Ovulatory dysfunction (AUB-O)	8 (10)
Endometrial hyperplasia (AUB-M)	9 (11.25)
No abnormality detected	4 (4.99)

Table 5: Other diagnostic modalities.

Modalities	Number of patients (n=80) N (%)
MRI	9 (11.25)
Hysteroscopy	2 (2.5)

Table 6: Primary treatment modality.

Primary treatment modality	N (%)
Medical	P 16 (20)
hormonal	E+P 10 (12.5)
n=30 (37.5%)	LNG-IUS 2 (2.5)
	SERMs 2 (2.5)
Surgical N=50 (62.5%)	D and C 12 (15)
	Hysteroscopic polypectomy 5 (6.25)
	Hysterectomy 33 (41.25)

Table 7: Hysterectomy as primary or subsequent mode of treatment.

Pattern of bleeding	Number of patients (n=80) N (%)
Primary hysterectomy	33
Hormonal treatment F/B hysterectomy	20
D and C F/B hysterectomy	10
Hormone F/B D and C F/B hysterectomy	5
Total	68

Table 8: Histopathological diagnosis of hysterectomy specimen.

HPE findings	Number of patients (n=68) N (%)
Endometrial polyps	5 (7.35)
Submucosal leiomyoma	8 (11.76)
Leiomyoma	23 (33.82)
Adenomyosis	21 (30.9)
Endometrial hyperplasia	10 (14.70)

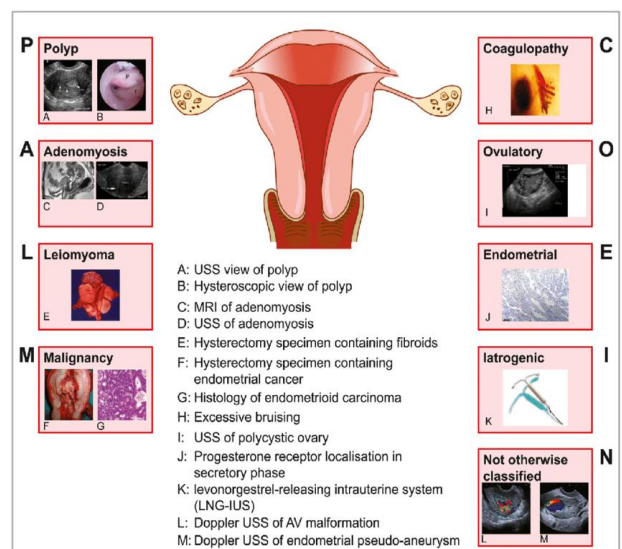


Figure 1: Abnormal uterine bleeding.

PALM-COEIN Classification System for AUB		
Cause	Abbreviation	Description
Structural (PALM)		
Polyps	AUB-P	Endometrial or endocervical proliferation of tissue that is vascular, glandular, fibromuscular, or connective in nature. Prevalence: up to 12% of women
Adenomyosis	AUB-A	Based on depth of endometrial tissue at interface of endometrium and myometrium and measured post hysterectomy. Reported prevalence: 5%-70%
Leiomyoma	AUB-L	Benign fibromuscular myometrial tumor (i.e., fibroid). Further classified as Submucosal or Other. Reported prevalence: 70%
Malignancy	AUB-M	Atypical hyperplasia, malignancy, premalignant hyperplastic process. Further classified via WHO or FIGO system. Reported prevalence depends on the type of premalignancy or malignancy; however, up to 3.5% of premalignant polyps in reproductive-age women and 15% of endometrial cancer cases occur prior to menopause. Current prevalence may not be known, owing to new WHO classifications
Nonstructural (COEIN)		
Coagulopathy	AUB-C	Coagulation-factor deficiencies, von Willebrand disease, hemophilia, platelet-function disorders. Reported prevalence: 13%
Ovulatory disorders	AUB-O	Endocrinopathies: PCOS, hypothyroidism, hyperprolactinemia, stress, obesity, anorexia, weight loss, extreme exercise. Iatrogenic: See criteria for AUB-I. Overall frequency undefined; dependent on type of disorder
Endometrial	AUB-E	Dysfunction of mechanisms that affect endometrial hemostasis. Endometrial inflammation and/or infection. Overall frequency undefined
Iatrogenic	AUB-I	Medication-related: oral and injectable anticoagulants, intrauterine systems, gonadal steroid therapy (estrogen, progestin, androgen), medication affecting dopamine metabolism (phenothiazines, tricyclic antidepressants), herbals (ginseng, ginkgo), decreased medication adherence. Overall frequency undefined
Not yet classified	AUB-N	Chronic endometritis, arteriovenous malformations, myometrial hypertrophy, any future entities not yet identified or defined. Overall frequency undefined

AUB: abnormal uterine bleeding; FIGO: International Federation of Gynecology and Obstetrics; PCOS: polycystic ovarian syndrome; WHO: World Health Organization.
Source: References 1, 7-10.

Figure 2: Pathophysiology of AUB.

DISCUSSION

In the present study 80 patients with AUB were evaluated where the cause for bleeding was structural uterine pathology. The study found that most patients with AUB were in the 40-45 years age group (48) 60% which is the perimenopausal age group, the findings are comparable with RENETA NICOLE et al 2015 in which 67.9% patients were in the 40-45 years age group.⁸ AUB was more frequent in multiparous patients which is comparable with the findings of SREELAXMI U et al 2017 and maximum patients (62) presented with heavy menstrual bleeding pattern of abnormal bleeding.¹⁰

Clinical diagnosis in this study is based mainly on ultrasonography findings. Ultrasonography gave primary diagnosis for 69 patients. Out of the remaining 11 patients, patients who had either large and/or multiple leiomyoma or advanced adenomyosis and MRI was used for precise diagnosis and lesion mapping. Whereas patients who had submucosal leiomyomas or endometrial polyps hysteroscopy was used as a diagnostic as well as therapeutic tool. Based on clinical as well as histopathology findings, maximum patients had leiomyoma, adenomyosis and endometrial hyperplasia as cause for AUB. Endometrial polyps and endometrial hyperplasia are closely related to estrogen excess, hence their pathophysiology can be associated. As well as endometrial hyperplasia can be combined with complicated structures and atypia, therefore the clinicians often have trouble to differentiate endometrial polyps from

endometrial hyperplasia. In addition, endometrial polyps can often be seen with endometrial hyperplasia or it can be within endometrial hyperplasia, but this is still unclear.¹²⁻¹⁴ Estrogen excess in this perimenopausal age group women is due to the fact that there is unopposed estrogen action because of intermittently anovulatory cycles due to declining estrogen levels and number of ovarian follicles.¹⁵ The limitations of the present study is without prospective follow-up, long-term outcomes of treatments and recurrence rates of AUB cannot be assessed and no office based endometrial biopsy in patients who were successfully managed medically for causes other than endometrial hyperplasia potentially missing diagnoses.

CONCLUSION

The PALM-COEIN classification system is easy, time efficient as well as accurate and should be used more in a clinical practice, to promote the ability of clinicians, researchers, and patients to speak in an equal language for better understanding and determining the causes of AUB. Transvaginal ultrasonography can be used as routine first line imaging modality, status of endometrium, leiomyoma, adenomyosis, adnexa, etc can be examined and additional investigations can be used where required. Clinical diagnosis may not always coincide with histopathological diagnosis and hence histopathological examination of all specimens of hysterectomy, D and C, polypectomy is necessary to not miss crucial diagnosis which may alter the treatment plan and modality of the patient. Medical-hormonal therapy is an effective treatment option and is also the first line management in most of the cases of perimenopausal AUB. Lack of compliance is one of the major causes for failure of medical management and shift to other options on medical management or surgical treatment may be required. Hysterectomy is the definitive treatment for AUB since the pathology is removed in entirety and can be performed by various routes such as abdominal, vaginal, laparoscopic and robotic. Treatment modality should be chosen after establishing proper diagnosis, involving the patient keeping in consideration physical, social, economical and mental factors.

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