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Original Research Article

FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in non-gravid women

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ABSTRACT

Background: Abnormal uterine bleeding is one of the most common problems of the women of reproductive age group leading to increased number of hospital visits. International federation of gynecology and obstetrics (FIGO) has suggested a new etiological classification system polyp, adenomyosis, leiomyoma, malignancy and hyperplasia, coagulopathy, ovulatory dysfunction, endometrial, iatrogenic, and not yet classified, known by the acronym PALM-COEIN to standardize the terminology, investigations, diagnosis and management of abnormal uterine bleeding (AUB) in non-pregnant women of reproductive age group.
Methods: This is a retrospective study on 150 patients of abnormal uterine bleeding to categorize them on the basis of PALM-COEIN classification. Patients were grouped under these categories after detailed history, examination, investigations and histopathological reports.
Results: Ovulatory dysfunction was the most common cause of AUB in patients presenting to the gynecology outpatient department (n=42, 28%). It was followed by leiomyoma (n=37, 24.67%) and endometrial causes (n=23, 15.33%). They constitute the top 3 causes of AUB. Adenomyosis (n=22, 14.67%), not known (n=10, 6.67%), iatrogenic (n=5, 3.33%), polyp (n=6, 4%), coagulopathy (n=1, 0.67%) and malignancy (n=4, 2.66%) contributing least to the PALM-COEIN classification as an etiology for AUB.
Conclusions: The PALM COEIN classification system is useful in understanding various etiological causes of AUB, facilitates accurate diagnosis and hence helps in optimizing the treatment.

Keywords: PALM-COEIN, Abnormal uterine bleeding, Ovulatory dysfunction, Leiomyoma

INTRODUCTION

Abnormal uterine bleeding (AUB) being a common gynecologic problem occurs in reproductive-age females should thoroughly be studied and diagnosed. There are various causes of AUB, can be divided in to broad two groups, structural and functional group of AUB. Structural group (due to some uterine pathology) include fibroids, endometrial polyps, adenomyosis, neoplasia. Whereas functional group includes (due to non-uterine cause) ovulatory dysfunction, coagulopathy, iatrogenic, endometrial, not known. AUB can be defined as any variation in frequency, regularity, duration, or volume from normal uterine bleeding and also includes intermenstrual bleeding (IMB) and unscheduled bleeding. It significantly increases physical as well as social morbidity among all non-gravid females.

International federation of gynecology and obstetrics (FIGO) has suggested a new classification system based on etiology, known by the acronym PALM-COEIN in 2010 which has been modified in 2018 to standardize the terminology, investigations, diagnosis and management of AUB in non-pregnant women of reproductive age group.[1]

The aim of this classification was to classify underlying causes of AUB in the reproductive age group so as to facilitate early diagnosis by appropriate investigation methods and improvise patients' clinical care.

METHODS

The present study is a prospective observational study conducted in a tertiary care hospital at the obstetrics and gynecology department, from 01 January 2023 to 31 December 2023. We studied 150 women for this, who met the inclusion criteria.

Inclusion criteria

Women of the reproductive age group, between menarche to menopause; 1 year after menopause; history of irregular menses, excessive bleeding for prolonged duration; and intermenstrual bleeding and increased frequency of menses and for at least 3 months of duration were included.

Exclusion criteria

Patients with vaginal bleeding due to cervical cause, and abnormal bleeding in antenatal patients were excluded.

After informed consent, detailed history including previous and current menstrual history, history of contraception use, medical/surgical history and drug history and followed by general, physical, systemic and gynecological examination of the patient, along with necessary blood investigations like complete blood count (CBC), coagulation profile, serum thyroid stimulating hormone (S. TSH), and S. prolactin. On gynecological examination, uterus (size, position, mobility and consistency), cervix (position of cervix, any erosion, hypertrophy, mobility, presence of polyp or ectopy) and adnexae (any palpable enlarged lump, tenderness and mobility) were assessed. Pelvic ultrasonography was done to assess the uterus (position, uterine size, endometrial thickness, presence of endometrial polyp, adenomyosis or fibroids) and ovarian status (presence of any cyst, mass and its characteristics) was done. Endometrial biopsy and hysterectomy specimens were sent for histopathological examination. Based on examination and investigations, patients are categorized according to PALM-COEIN classification. After per speculum and per vaginal examination followed by ultrasound, polyp, adenomyosis and leiomyoma were identified and were categorized under AUB-P, AUB-A and AUB-L respectively. The AUB-M category included patients with bleeding because of endometrial carcinoma diagnosed on the basis of histopathological examination report of endometrial biopsy. These patients were referred to other center for further management. The AUB-C category included the patients taking any form of anticoagulant or with known history of coagulation defects since a younger age. The AUB-O included bleeding due to ovarian dysfunction, with irregular timing or unpredictable bleeding patterns with variable amounts of bleeding. AUB-E was used for abnormal bleeding occurring in cyclical and predictable pattern usually suggestive of ovulatory cycle and no other cause was identified. AUB-I included patients with intrauterine devices (inert or medicated) or having history of gonadal steroid intake in the preceding 3 months. Women not fitting into any category (endometritis and AV malformation) were put under not yet classified category i.e. AUB-N.[2,3]

RESULTS

Total 150 participants were included in the study. All these cases were placed in the nine categories of the PALM-COIEN classification (Table 1).

Most common age group (46.67%) affected in this study was 40-49 years. Most women seek medical care after experiencing symptoms of abnormal uterine bleeding for a period of 6 months to 1 year. The most common presenting symptom in our study was heavy menstrual bleeding (43.3%) followed by irregular bleeding in 28.6% cases.

Table 1: Age distribution of study population (n=150).

Age group (years)	Overall (%)
<20	1 (0.67)
20-29	15 (10)
30-39	55 (36.67)
40-49	70 (46.67)
>49	9 (6)

Table 2: Distribution of study population based on presenting complaint (n=150).

Complaint	N (%)
Heavy menstrual bleeding	65 (43.3)
Irregular bleeding	43 (28.6)
Intermenstrual spotting	9 (6)
Frequent menses	33 (22)

Total 150 participants were included in the study. All these cases were placed in the nine categories of the PALM-COIEN classification.

The PALM (structural) and COEIN (functional) components accounted for 46% and 54%, respectively. The patients were classified according to PALM-COEIN classification, it was found that ovulatory dysfunction was the most common cause of AUB in patients presenting to the gynecology outpatient department (n=42, 28%) in overall and also in the functional group. Whereas leiomyoma (AUB-L) was the proposed major contributor in the structural group. They were followed by endometrial AUB-E 23 (15.33), adenomyosis AUB-L 22 (14.67), not known AUB-N 10 (6.67), polyp AUB-P 6 (4), iatrogenic AUB-I 5 (3.33), malignancy AUB-M 4 (2.66) and coagulopathy AUB-C 1 (0.67) which was contributing least to the PALM-COEIN classification for AUB (Table 3).

Table 3: Distribution of study population based on PALM-COEIN classification (n=150).

Diagnosis	N (%)
PALM (structural group) n=69 (46%)	
AUB-P (polyp)	6 (4)
AUB-A (adenomyosis)	22 (14.67)
AUB-L (leiomyoma)	37 (24.67)
AUB-M (malignancy)	4 (2.66)
COEIN (functional group) n=81 (54%)	
AUB-C (coagulopathy)	1 (0.67)
AUB-O (ovulatory dysfunction)	42 (28)
AUB-E (endometrial)	23 (15.33)
AUB-I (iatrogenic)	5 (3.33)
AUB-N (not known)	10 (6.67)

DISCUSSION

The PALM–COEIN classification has an advantage of considering the entire range of possible aetiologies so as to know the precise etiology of AUB for successful management of AUB. AUB was seen mostly between 40-49 years, similar to a study by Arnold et al.[4] The transition from ovulatory cycles to menopause begins in late 40's. There will be a rise in FSH levels leading to increased ovarian follicular response and high estrogen levels. The accelerated loss of ovarian follicles causes episode of anovulation, leading to irregular, unpredicted pattern of bleeding.[5] In our study, ovulatory dysfunction was the most common cause of AUB (28%) which was comparable to a study done by Tater et al, maximum patients of AUB were seen in ovulatory dysfunction (30%) followed by leiomyoma (24%).[6] In the study done by Qureshi et al, maximum patients of AUB were classified under leiomyoma category, the number being 25% followed by ovulatory dysfunction (24%).[7] Leiomyoma was the 2nd most predominant cause of AUB (24.67) in the present study. HMB may be due to increased endometrial surface area, hyperestrogenemia causing endometrial hyperplasia, presence of fragile and engorged vasculature in the perimyoma tissue release of angiogenic factors like vascular endothelial growth factor (VEGF), platelet-derived growth factor (PDGF), which impair local endometrial hemostasis.[8]

Though majority of polyps are asymptomatic, the contribution to AUB varies from 3.7% to 65%.[9] In the present study, 4% of cases of AUB was caused by polyps, which was slightly less as compared to study done by Doraiswamy et al also showed that polyps accounted for 11.2% cases of AUB.[10]

14.67% women were diagnosed with adenomyosis, similar to Qureshi et al study where 15% cases of AUB had adenomyosis.[7] Pregnancy might facilitate the formation of adenomyosis by allowing adenomyotic foci to be included in the myometrium due to the invasive nature of the trophoblast on the extension of myometrial fibers.[11,12] In addition, adenomyotic tissue may adenomyosis is observed in association with a higher ratio of estrogen receptors and increased aromatization. According to Taran et al, 70 to 80% of women undergoing hysterectomy for adenomyosis are in their fourth and fifth decade of life and are multiparous.[13]

Endometrial hyperplasia, which involves proliferation of endometrial glands and its progression to endometrial carcinoma can cause AUB.[14] As endometrial cancers are common in the age group 50-60 years, the AUB-M was seen in only 2.66% of cases, similar to Qureshi et al study and Mishra et al study.[5,7]

AUB-C (coagulopathy) contribute only 1 case (0.67%) in present study, similar to Qureshi et al study (0.3%).[7]

AUB-E is a diagnosis of exclusion. A primary disorder of the endometrium may be due to abnormal prostaglandin synthesis and increased plasminogen.[15] The endometrial causes of AUB were comparable in the present study (15.33%) and Mishra et al study (12.2%).[7]

Many episodes of unscheduled bleeding are related to exogenous therapy.[9] Medications like anticonvulsants, hormonal steroids may have direct impact on ovulation. Intrauterine contraceptive device (IUD) may cause low grade endometritis and also cause unbalanced ratios of prostaglandins and thromboxanes which may contribute to AUB.[9] Iatrogenic causes contributed to 3.33% of cases of AUB.

The category not yet classified is reserved for entities like chronic endometritis, myometrial hypertrophy which contributed to 6.67% of cases.

Specific management of various categories of PALM COEIN classification like AUB-P includes resection of polyp, AUB-A includes hysterectomy or adenomyomectomy (not frequently preferred), AUB-M includes surgery and/or adjuvant treatment, or if surgery is not possible, it can be managed using high dose progesterone or palliation (including radiotherapy), AUB-C includes using tranaxemic acid, AUB-O can be managed by lifestyle modification or specific management of hyperprolactinemia using cabergoline or hypothyroidism using levothyroxine. Antibiotics can be given for endometritis and embolization can be done for AV malformations.

There are various previous studies done by Khrouf et al, Munro et al, Madhra et al, Bahamondes and Ali, which categorize patients of AUB according to the FIGO PALM-COEIN classification.[2,5,8] In almost all the previous studies, ovulatory dysfunction and leiomyoma contribute the most for abnormal uterine bleeding.

This classification system may need some modifications as investigation methods change from time to time. This study only includes symptomatic cases, as few causes may be asymptomatic also. In this study all investigations for

coagulation disorders were not done due to cost factor. This study includes only small number of cases of AUB. Many causative factors causing AUB may co-exist in same individual.

CONCLUSION

The PALM COEIN classification system is useful in understanding various etiological causes of AUB, facilitates accurate diagnosis and hence helps in optimizing the treatment. Management is decided based on etiology of AUB and this classification makes it easier.

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