

PALM-COEIN Classification for Abnormal Uterine Bleeding: A Study of its Practical Applicability and Distribution of Causes

Zalak Vinaybhai Karena¹, Aditya Dharmesh Mehta², Sanjay Vikani³

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ABSTRACT

Aim: The aim was to study the distribution of causes in nongravid women of reproductive age-group having abnormal uterine bleeding (AUB) as per the new International Federation of Gynecology and Obstetrics (FIGO) polyp; adenomyosis; leiomyoma; malignancy and hyperplasia; coagulopathy; ovulatory dysfunction; endometrial; iatrogenic; and not yet classified—(PALM-COEIN) classification system and to evaluate the practical applicability of this classification system in the clinical scenario.

Materials and methods: A prospective cross-sectional study was conducted among 300 women with AUB attending the outpatient department of gynecology, selected by the kth random sampling technique. The etiological diagnosis was made in the PALM-COEIN spectrum. The practical applicability of the AUB-FIGO classification system was assessed by the survey of clinicians with help of a scoring system.

Results: The majority of the study subjects were from 40 to 55 years age group with the median age of the study subjects being 42 years. Fifty-two subjects had two attributable causes from PALM-COEIN for AUB. In our study, 45% of subjects had leiomyoma, which turned out to be the most common etiology for AUB, and hypothyroidism was the most common endocrinopathy associated with 10% of AUB cases. Hysteroscopy was required to diagnose one case of amenorrhea. The clinician survey emphasized the high practical applicability of PALM-COEIN classification.

Conclusion: The data generated from the clinical settings with this classification could be more comparable due to homogeneity and consistency in nomenclature.

Clinical significance: The International Federation of Gynecology and Obstetrics classification for AUB is a clinician-friendly modality providing an easy algorithm for accurate diagnosis and definitive treatment of AUB.

Keywords: Abnormal uterine bleeding, FIGO, Heavy menstrual bleeding, PALM-COEIN, Practical applicability, Qualitative survey, Reproductive age group.

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INTRODUCTION

The term AUB is used to describe uterine bleeding that varies from normal parameters of menstruation.¹ Abnormal uterine bleeding is a common health problem for approximately 30% of women of reproductive age and is experienced by 15–20% of women attending the outpatient gynecology clinics.² It interferes with the quality of life, and those afflicted spend substantial personal resources on menstrual products and pharmaceuticals. Chronic AUB is associated with a reduction in work productivity by approximately 30%.^{3,4} In 2007, it was estimated that the total annual direct and indirect costs of AUB exceeded \$37 billion in the USA.⁵ In the developing world, the high prevalence of iron deficiency in women has been linked to nutrition and the symptom of heavy menstrual bleeding (HMB).

Although about a third of visits to gynecologists are related to one or more AUB symptoms, but only half of the affected women actually seek care, and, when they do, the level of satisfaction is frequently low.⁶ Hence, studying the distribution of causative factors of AUB in a given clinical setting and thereby targeted management beyond the empirical treatment is of utmost importance to restraint the morbidity due to AUB and improve the quality of life. To standardize education, facilitate the interpretation of research, as well as translational and clinical investigation, PALM-COEIN was developed by FIGO to deal the confounding in the design and interpretation of bench and clinical research.⁷

¹Department of Obstetrics and Gynaecology, Pandit Deendayal Upadhyay Medical College, Rajkot, Gujarat, India

²Department of Radiodiagnosis, Pandit Deendayal Upadhyay Medical College, Rajkot, Gujarat, India

³Department of Anatomy, Banas Medical College & Research Institute, Palanpur, Gujarat, India

Corresponding Author: Zalak Vinaybhai Karena, Department of Obstetrics and Gynaecology, Pandit Deendayal Upadhyay Medical College, Rajkot, Gujarat, India, Phone: +91 08200468521, e-mail: Zkarenawork@gmail.com

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More studies and data collection of AUB with PALM-COEIN system needs to be generated for ongoing and upcoming researches to fill the knowledge and information gap with a more systematic and standardized method of PALM-COEIN, being now prevalent.

Our study was designed with an aim to determine the distribution of causes of AUB, based on PALM-COEIN in patients attending

Table 1: Etiological distribution of AUB as per PALM-COEIN in various age groups

	Age: 10–19 yrs (n = 12)	Age: 20–39 yrs (n = 124)	Age: 40–55 yrs (n = 164)
Polyp	–	2 (1.6%)	5 (3%)
Adenomyosis	–	25 (20.1%)	56 (34.1%)
Leiomyoma	–	49 (39.5%)	84 (51.2%)
Malignant and premalignant	–	2 (1.6%)	6 (3.6%)
Coagulopathy	1 (8.3%)	–	–
Ovulatory etiologies	10 (83%)	21 (16.9%)	13 (7.9%)
Endometrial etiologies	–	6 (4.8%)	–
Iatrogenic	1 (8.3%)	18 (14.5%)	–
Not yet classified	–	1 (0.8%)	–
PALM*	78 (26%)		151 (50.3%)
COEIN*	58 (19.3%)		13 (4.3%)

our institute and to treat them eventually, in a more evidence-based way as per the good clinical practice recommendations on AUB in reproductive period by the Federation of Obstetric and Gynaecological Societies of India (FOGSI).

Any new classification developed in medical science for clinical practice is expected to serve and is assessed broadly on these basic dimensions: (1) Information: assembly, storage, and retrieval to its best specificity and correctness; (2) practical applicability and acceptability in clinical settings; (3) interobserver agreement; and (4) meager proportion of unexplained or not yet classified segment.⁸ In our study, we designed a study specific scoring system questionnaire to be filled by resident clinicians to assess practical applicability of PALM-COEIN classification.

Aim

The aim of this study was to assess the distribution of causes in nongravid women of reproductive age group having AUB as per the new PALM-COEIN classification system and to evaluate the practical applicability of this classification system in clinical scenario.

MATERIALS AND METHODS

Our study was carried out at a tertiary level hospital and medical college in Rajkot in the Department of Obstetrics and Gynaecology (OBGYN). The subjects in the study were AUB cases that were selected on outpatient basis with *k*th sampling technique. Nongravid women of reproductive age group with chief complaint of AUB were included in the study. Pregnant women with bleeding and women with cervical cause and with local lesions on vagina and vulva for bleeding per vaginam were excluded.

Acute AUB was defined as an episode of heavy bleeding of sufficient quantity to require immediate intervention with or without history of previous AUB.^{9,10} Chronic AUB is defined as bleeding from the uterine corpus that is abnormal in volume, regularity, and/or timing, present for past 6 months which may not require urgent intervention. Intermenstrual bleeding (IMB) occurs between clearly defined menses. Such bleeding may occur at random times or may manifest in a predictable fashion at the same day in each cycle.¹¹ Unscheduled bleeding between menstrual cycle when using hormonal medications is reported separately.⁷ Four basic criteria to define menses, frequency, duration, regularity,

and volume, as reported by the patient were used to classify the menstrual pattern of attending patients.

A specially designed modified pro forma derived from algorithms from PALM-COEIN classification system was used to collect the data of included subjects after obtaining the necessary consent. After acquiring the demographic details, medical history, physical examination, and necessary imaging, the enrolled subjects were classified as per the FIGO classification system and treated as per the hospital protocols and good practice recommendations for the Indian women with AUB.

Clinician survey was conducted among doctors with minimum of 1 year experience in OBGYN specialty. Thirty clinicians were enrolled for clinician survey. Each clinician assessed five cases of AUB as per PALM-COEIN classification under the guidance of Principal investigator (PI) or Co-PI. And, thereafter were surveyed for assessment of practical applicability of PALM-COEIN classification system with a specially designed scoring questionnaire. The PALM-COEIN classification system was scored on six parameters: include and diagnose all etiologies of AUB with accuracy, ease to diagnose, time saving, systematic, aid in treatment, and preference to re-use.

The study was approved by the Institutional Ethical Committee and informed consent was obtained for all study subjects. Statistical analysis was carried out using SPSS. Chi-square test was used for comparison of causes between different age groups. *p*-value <0.05 was considered statistically significant.*

RESULTS

Three hundred subjects with AUB were included in the study. Approximately 54% of study subjects were from 40 to 55 years age group (Table 1). Approximately 4% of study subjects were from adolescent age group. The median age of the study subjects was 42 years. Approximately 89% of subjects with AUB were married, and 4% had habit of smoking. Approximately 35% of cases had parity of three or more. Age-wise distribution of PALM-COEIN showed structural causes—PALM more common in elder and premenopausal age group and nonstructural pathology and COEIN more common in adolescent and middle age group. *p*-value <0.05 was considered statistically significant.

Four subjects had acute AUB. PALM constituted 229 subjects (76%) and COEIN constituted 71 subjects (24%, Table 2).

Table 2: Etiological distribution of AUB cases as per PALM-COEIN

<i>Etiology, Frequency</i>	<i>Incidence</i>	<i>Menstrual pattern of AUB</i>	<i>Diagnostic modality</i>
Polyp, 7	2.3%	IMB, HMB, PMB	USG-5, SIS-2
Adenomyosis, 90	30%	HMB	USG-86, MRI-4
Leiomyoma, 136 (45%)	Subserosal – 36 (12%) Intramural – 88 (29%) Submucous – 12 (4%)	PMB, HMB	USG-131, MRI-5
Malignant and premalignant lesions, 21 (7%)	Malignant – 1 (0.3%) Premalignant – 20 (6.6%)	IRMB, HMB	Curettag-17 Pipelle biopsy-4
Coagulopathy, 1	(0.3%)	HMB	Coagulation profile
Ovulatory etiologies, 66	22%		
Endocrinopathies 41 (13.6%)	PCOS – 4 (1.3%) Hypothyroidism – 30 (10%) Hyperthyroidism – 1 (0.3%) Weight loss and exercise – 2 (0.6%) Obesity – 2 (0.6%) Hyperprolactinemia – 1 (0.3%) Mental stress – 1 (0.3%)	OM HMB OM A A A FB	USG Thyroid profile Serum prolactin levels BMI
Extremes of reproductive age, 22 (7.3%)	Adolescence – 9 (3%) Premenopause – 13 (4.3%)	HMB HMB	
Drugs, 3 (1%)	Psychiatric drugs – 3 (1%)	A	
Endometrial, 9 (3%)	Asherman's syndrome – 1 (0.3%) Tuberculosis – 1 (0.3%)	A A	Hysteroscopy Mantoux test CBNAAT PCR
	Anticoagulant drugs – 1 (0.3%) <i>Chlamydia</i> infection – 6 (2%)	HMB IMB, IRMB, FB	
Iatrogenic, 21 (7%)	Medroxyprogesterone acetate injection (Antara) – 10 (3.3%) Copper IUD – 9 (3%) OC pills – 2 (0.6%)	HMB, PMB, USB USB, PMB USB	
Not yet classified, 1	0.3%	IRMB	

A, amenorrhea (absent); FB, frequent bleeding; IRMB, irregular menstrual bleeding; PMB, prolonged menstrual bleeding; USB, unscheduled bleeding

Fifty-two subjects had two attributable causes from PALM-COEIN for AUB. Leiomyoma with adenomyosis and hypothyroidism were the most common associated etiologies. One hundred and thirty-six (45%) subjects had leiomyoma, which turned out to be the most common etiology for AUB, and hypothyroidism was seen in 30 subjects, being the most common cause of AUB-O. Ultrasound was the most common modality of diagnosis with hysteroscopy being required to diagnose one case of amenorrhea. This turned out to be Asherman's syndrome. Medroxyprogesterone acetate (Antara injection) widely given as contraceptive contributed to be the major cause, 47% cases of iatrogenic AUB with major complaint of unscheduled bleeding by the subjects. Adolescent cases included majority being AUB-O (83%). Leiomyoma and adenomyosis being the most common etiologies in our study group, and 58% of cases were provided surgical management.

All clinicians during the clinician survey were in the opinion that due to the better classification of nonstructural causes, its correlation with the menstrual pattern and algorithmic approach for diagnosis of causes of AUB, better and definitive management of nonstructural causes of AUB, was possible almost like structural causes of AUB. Diagnostic algorithm in PALM-COEIN was a time efficient way of managing AUB cases and all clinicians had great inclination for continued use of FIGO classification, as it was highly practicable approach in clinical settings (Table 3).

DISCUSSION

In our study, age group 40–55 years had maximum number of subjects and the median age was 42 years. This is similar to Ratnani et al.¹² having similar age group distribution of subjects. PALM group contributed to be the major cause of AUB subjects than

Table 3: Clinician survey score to determine practical applicability of FIGO classification system (PALM-COEIN)

Parameters	Mean score (0–4)
Include and diagnose all etiologies of AUB with accuracy	3.7
Ease to diagnose	3.6
Time saving	3.6
Systematic	3.4
Aid in treatment	4
Preference to reuse	3.7

COEIN group and among the COEIN group, ovulatory disorders were the most common etiology for AUB, which is similar to the findings of study by Betha et al.¹³ In our study, Abnormal uterine bleeding-Leiomyoma (AUB-L) was the major group of distribution, which is similar to the finding in studies by Mishra et al.¹⁴ Hypothyroidism is the most common endocrine disorder presenting with AUB in our study. In our study, hypothyroidism constituted 10% cases similar to the study by Thakur et al.¹⁵ In our study, we had one case of tuberculosis presenting with amenorrhea.

CONCLUSION

The data generated from the clinical settings with this classification could be more comparable due to homogeneity and consistency in nomenclature. FIGO classification is an efficient and more relevant approach to embark in the journey of AUB management.

Clinical Significance

The International Federation of Gynecology and Obstetrics classification for AUB is a clinician friendly modality providing easy algorithm for accurate diagnosis and definitive treatment of AUB. Hypothyroidism is a frequently missed out cause of AUB, contributing a significant number of cases of AUB treatable with medical management and should be in higher index of suspicion for diagnosis in our clinical settings.

ORCID

Zalak Vinaybhai Karena  <https://orcid.org/0000-0002-7730-1309>

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