Original Research Article

Implementation of PALM-COEIN classification and clinicopathological correlation in Northern India

Keshav Ram Benipal[1],*, Bhavna[2], Rajeev Sood[3], Anoop Sharma[3]

[1]Dept. of Obstetrics and Gynecology, Civil Hospital, Solan, HImachal Pradesh, India
[2]Dept. of Obstetrics and Gynecology, Shree Balaji Hospital, Kangra, Himachal Pradesh, India
[3]Dept. of Obstetrics and Gynecology, Indira Gandhi Medical College & Hospital, Shimla, Himachal Pradesh, India

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ABSTRACT

Abnormal Uterine Bleeding is most common complaint during reproductive age group. The woman with AUB were classified according to PALM-COEIN classification. The most of the woman (38%) belongs to AUB(L). The most common histopathological finding was secretary phase of endometrium 44.28%. The most common histopathological finding in AUB(M) was simple hyperplasia without atypia was 77.77%. Therefore the PALM- COEIN classification system is applicable globally and should be followed every health facility.

1. Introduction

Introduction abnormal uterine bleeding (AUB) is most common problem in reproductive age group and this affect their quality of life. The bleeding may be abnormal in frequency, amount or duration or combination of all.[1]

During reproductive age 10-15% of women having episode of AUB. It is common during extreme of life following pregnancy and lactation. About 55.7% of adolscents having AUB during first year or so after menarchae. This is because immaturity of hypothalamus pituary ovarian axis which takes 1.5-2 years to establish a regular cycle.[2]

Acute AUB is defined as an episode of bleeding in a women of reproductive age who is not pregnant and in a sufficient quantity to require immediate intervention to prevent further blood loss. The chronic AUB is bleeding from the uterus that is abnormal in duration for the last six months. International federation of gynaecology and obstetrics (FIGO) devised universally acceptable PALM COEIN classification.[3] Classification includes nine main categories polyp, adenomyosis, leiomyoma, Malignancy & hyperplasia endometrium, coagulopathy, ovulatory disorders, endometriam, iatrogenic & non classified.

PALM includes visually objective structural criteria and COEIN includes not related to structural anomalies.

1.1. (AUB-P) Polypus

It is defined by ultrasound, saline sonography or hysteroscopy where facility available. This category is subdivided according to location, number, size and histology.

1.2. (AUB-A) Adenomyosis

It is a condition where there is a in growth of endometrium directly in myometrium. It is diagnosed by ultrasound and MRI. MRI is expensive and not available in many centres. The category is subdivided depending upon the depth of endometrial myometrial invasion. Many cases of adenomyosis are asymptomatic and diagnosed on hysterectomy specimens, however definitive diagnosis is made by histologic diagnosis.

* *Corresponding author.*
E-mail address: drbenipalkeshav@gmail.com (K. R. Benipal).

1.3. (AUB-L) Leiomyoma

This is a commonest benign tumour of uterus. Many leiomyomas are co-incidental findings and 50% of leiomyomas are asymptomatic. These are detected during routine checkup or ultrasonography done for unrelated symptoms. The incidence of symptomatic fibroid in routine OPD is about 3%. The fibroids are seen in child bearing age group (30-40 years) but rarely before 20 years,nulliparous or low parity.

1.4. (AUB-M)Malignancy and premalignant lesions

It is rare in the reproductive age group but may occur in a female with polycystic ovarian disease(PCOD) and chronic an ovulation. The diagnosis is by histopathological examination of the endometrium samples (D/C, F/C biopsy) or by hysteroscopic biopsy samples.

1.5. (AUB-C) Coagulopathy

This cause AUB in around 13–20% women of reproductive age. It consists of a spectrum of systemic disorders of haemostasis. The most common is von Willebrand's disease. However, many of these may be asymptomatic and not related to AUB.

1.6. (AUB-O) Ovulatory disorders

Eighty per cent are an ovulatory bleeding with unpredictable, irregular menstrual cycles, some with heavy bleeding. Metropathia haemorrhagica usually met in premenopausal women about 40-45 years age. Women present with continuous painless vaginal bleeding. Twenty percent are ovulatory but may be a consequence of 'luteal-out-of phase' (LOOP) events with deficient progesterone. follicular development is speeded up with resulting shortening of follicular phase. Some of these are caused by hypothyroidism, hyperprolactinaemia.

1.7. (AUB-E)Endometrial causes

Most AUB-E cases appear to be due to disturbances of metabolic molecular pathways such as those involving tissue fibrinolytic activity, prostaglandins and other inflammatory or vasoactive mediators. In rare cases, it is due to tubercular endometritis or infection, particularly chlamydial infection. There are no tests available, except for infections, to estimate the local causes, and the case is placed in this category by exclusion of other causes.

1.8. (AUB-I) Iatrogenic

This is caused by steroidal hormones administered as contraceptives, especially in low dose, IUCD, copper T may cause unscheduled 'break-through bleeding' or menorrhagia. The drugs that are responsible are anticoagulants, phenothiazine and tricyclic antidepressants which affect dopamine metabolism.

1.9. (AUB-N) Not classified

This includes arteriovenous (A-V) malformations, varicose veins of the uterine vessels and myohyperplasia. No cause is discernable with existing investigations.

Apart from medical therapy for the management of AUB, there is the introduction of more conservative techniques for the management of menorrhagia such as the Mirena (LNG- IUS) and second - generation endometrial ablation techniques, the role of operative hysteroscopy with either the resect scope or laser has diminished markedly. As a result, their main use is in the management of submucosal fibroids. [4] BONNEYS P 103 operation on uterine cavity.

2. Materials and Methods

This study was conducted the department of obstetrics and gynecology in a tertiary care in Govt. hospital for a period of one year.(w.e.f 1st August 2018 to 31st July 2019) the study including 210 of females with complaints of AUB. The written inform consent was taken from the patients.

2.1. Inclusion criteria

All the females of the reproductive age group who presented in gynecology OPD with AUB and who give the informed consent and hysterectomy was performed.

2.2. Exclusion criteria

Women who didn't give consent were excluded from the study.

All patients obstetric and detailed menstrual, contraceptive history was recorded. Apart from general physical examination complete gynecological examination was done. Wherever indicated ultrasound or other tests were done for the diagnostics. All the patients were categorized according to the PALM-COEIN classification. Endometrial biopsy/hysterectomy (where indicated) was performed. On histopathological report all the cases were categorized according to PALM-COEIN Classification. The data was analyzed using SPSS Software.

3. Results

There are 210 patients participated in the study. Most of patients90 (42.85%) belongs to 46-50years and 85 (40.48%) of belongs to 41-45 years, where as only 35 (16.67%) belongs to >51year. Most of the patients presented with menorragia.

Table 2 shows distribution of cases as per clinical diagnosis. The PALM and COEIN components accounted form =130 (61.90%) and 80 (38.10%), respectively. Leiomyoma (AUB-L) was assigned to be the major etiology

Table 1: Age group distribution of cases

S. No.	Age group	Number	% Age
1	41-45 years	85	40.48%
2	46-50years	90	42.85%
3	>51years	35	16.67%

Table 2: Distribution of cases as per clinical diagnosis

S. No.	Events	Number	% Age
	PALM n =130 (61.90%)		
1	AUB-P (polyp)	10	4.7%
2	AUB-A (adenomyosis)	19	9.0%
3	AUB-L (leiomyoma)	80	38%
4	AUB-(A+L)	12	5.7%
5	AUB-M (malignancy and hyperplasia)	09	4.2%
	COEIN n=80 (38.10%)		
6	AUB-C (coagulopathy)	0	0
7	AUB-O (ovulatory disorders)	73	34%
8	AUB-I (iatrogenic)	0	0
9	AUB-E (endometrial)	07	3.33%
10	AUB-N (not yet classified)	0	0

in 80 (38%) in the structural group, whereas ovulatory disorders (AUB-O) were the major contributor in the functional group accounting for 73(34%).

Table 3: Endometrial pattern on histopathology

S.No.	Endometrial pattern	No. of cases	% Age
1	Secretory phase	93	44.28%
2	Proliferative phase	77	36.66%
3	Hyperplasia	18	8.57%
4	Adenocarcinoma	2	0.95%
5	Squamous cell carcinoma	2	0.95%
6	Inflammatory	6	02.8%
7	Proliferative phase with dilatation of glands	12	05.71%

Table 3 showed that most of cases were reported as secretary phase of endometrium 93 (44.28%) followed by Proliferative phase 77 (36.66%). Adenocarcinoma and squamous cell carcinoma contributed 2 (0.95%) each, such patients were attached to radiotherapy department.

Table 4 showed that 77.77% of patients were with Simple hyperplasia withoutatypia and only 05.55% with Complex hyperplasia without atypia.

Out of the 210 cases of the Hysterectomy, the clinical and pathological results were correlated. The concordance rates in the clinical and pathological diagnosis in the case of AUB-P, AUB-A and AUB-L were excellent with 89%, 92% and 91.5% respectably and the results were statistically significant <0.001. The cases of AUB-

Table 4: Distribution of cases of endometrial hyperplasia

S. No	Endometrial hyperplasia	No of cases	% Age
1	Simple hyperplasia without atypia	14	77.77%
2	Simple hyperplasia with atypia	03	16%
3	Complex hyperplasia without atypia	01	05.55%
4	Complex hyperplasia with atypia	0	0%

A which were missed clinically were detected(35) on histopathological examination. However the adenomyosis is a histopathological diagnosis which needs MRI for clinical diagnosis which is not available in every institution. The clinic pathological concordance rates were moderately fair in AUB-(A+L), AUB-M and AUB-O with 72%, 55.6% and 72% respectably. In AUB-M there were 9 cases were suspected but only 5 cases of histopathology were confirmed. This might explain lower clinicopathological concordance.

4. Discussion

Out of 210, 130 patients belonged to PALM structural component and 80 belonged to COEIN functional component.AUB (L) 80(38%) was the most common cause for AUB followed by AUB(A)19(9%)which is also seen in other studies.[5–7] Eighty(38.10%)belonged to COEIN functional component which was similar to studies conducted by Mishra and sultan.[5] Most of the subjects belonged to 46-50 (42.85%)years, hence age is also suggested an impotent risk factor for AUB.[5–7]

AUB (O) 73(34%) subjects belonged to ovulatory disorder functional component of COEIN which was similar to the study conducted by Mishra and sultan.[5] In later reproductive age group there may be unusual disturbed ovulation called 'luteal-out-of phase' (LOOP) events contributing towards AUB. The deficiency in vasoconstrictors PGF-2a, endothelin and increased production of vasodilators i.e PG-E 2 and prostacycline, which are locally produced may lead to heavy menstrual bleeding.[8]

The most common histopathological finding reported was secretary phase of endometrium 93 (44.28%) followed by Proliferative phase 77 (36.66%), which is also seen in the study conducted by Mishra and sultan.[5]

In our study we found that most of cases of AUB (L) which were diagnosed clinically were confirmed (92%) on histopathologically p value<0.001. This can be explained that fibroids can be easily diagnosed in clinical examination and ultrasonography/MRI.[5]

In AUB (A) clinical diagnosis was confirmed by histopathology. There were additional cases were diagnosed

Table 5: Correlation of clinical and histopathology-based diagnosis

	PALM n =130 (61.90%)	Clinical diagnosis	Histopathological diagnosis	Concordance between clinical & HPE diagnosis	P value
1	AUB-P (P,A;P,L)	10	14	89%	<.001
2	AUB-A (P,A;P,A,L;A,E)	19	54	92%	<.001
3	AUB-L(L,A;L,A,P;P,L)	80	86	91.5%	<.001
4	AUB-(A+L)	12	46	72%	
5	AUB-(P,A)	0	3		
6	AUB-M(malignancy& hyperplasia)	09	5	55.6%	<0.005
7	COEIN n=80 (38.10%)				
8	AUB-C (coagulopathy)	0	0		
9	AUB-O(ovulatory disorders)	73	15	72%	<.005
10	AUB-I (iatrogenic)	0	0	0	
11	AUB-E (endometrial)	08	0	0	
12	AUB-N (not yet classified)	0	0	0	

on histopathology which were missed clinically which is also seen in other study.[5–7,9] Due to lack of MRI facility in every centre adenomyosis may be missed clinically.[10]

The coexistant cases of AUB-L, A, P were noted in hysterectomy cases which was missed clinically and diagnosed on histopathology.[5–11]

Total number of subjects were reported as simple hyperplasia without atypia and with atypia was 77.77% and 16% respectivily, the most common histopathological finding in AUB-M.

The simple hyperplasia and complex hyperplasia with or without atypia are known to be precancerous lesion of endometrial carcinoma were reported 1-3% and 8-29% respectively.[6–9,11]

The PALM -COEIN classification system is applicable globally and thus universal terminology can be followed. This is an easy pneumonic to remember and can be used for inter-institutional research on AUB.

5. Conclusion

When the AUB cases were classified according to PALM -COEIN classification system, the clinicopathological correlation was good. Few cases were diagnosed on pathological examination which were missed on clinical examination.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Livingstone M. Mechanisms of abnormal uterine bleeding. *Hum Reprod Updates*. 2002;8(1):60–7.
2. Padubidri VG, Daftary SN. Shaw,s Text book of gynaecology. 16th ed. Elsevier; 1997.
3. Munro MG, Critchley HO, Broder MS. FIGO classification system (PALM COIEN) for causes of abnormal uterine bleeding in non gravid women of reproductive age. FIGO Working Group on Menstrual Disorders. *Int J Gynaecol Obstet*. 2011;113:3–13.
4. Lopes T, Spirtos N, Naik R, Monaghan J. Operation on uterine cavity. In: Bonneys Gynaecological surgery. Wiley Blackwell; 2011. p. 103.
5. FIGO Committee on Gynecologic Practice. Management of Acute AUB in non pregnant reproductive age group women Committee opinion No. 557. April 2013.
6. Ramachandran T, Sinha P, Subarmanium. Correlation between clinico-pathological and ultrasonographical findings. *J Clin Diagn Res*. 2011;5(4):737–40.
7. Bhosle A, Fonscea M. Evaluation and histopathological correlation of abnormal uterine bleeding inperimenopausal women. *Bombay Hosp J*. 2010;52(1):69–72.
8. Perveen S, Perveen S. Endometrium histology in abnormal uterine bleeding. *Q Med Channel*. 2011;17(4):68–70.
9. Jairajpuri ZS, Jetley S, Rana S. Morphological spectrum of endometrial pathology in middle-aged women with atypical uterine bleeding: A study of 219 cases. *J Midlife Health*. 2013;4(4):216–20.
10. Dadhania B, Dhruva G, Agravat A. Histopathological study of endometrium in dysfunctional uterine bleeding. *Int J Res Med*. 2013;2(1):20–4.
11. Khan S, Hameed S, Umber A. Histopathological pattern of endometrium on diagnostic D&C inpatients with abnormal uterine bleeding. *ANNALS*. 2011;17(2):166–70.

Author biography

Keshav Ram Benipal Senior Resident

Bhavna Obstetrician & Gynaecologist

Rajeev Sood Professor

Anoop Sharma Associate Professor