International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2019; 2(1): 174-181
Received: 17-01-2019
Accepted: 20-02-2019

Dr. Srinivas DD Gubbala
Associate Professor,
Department of Pathology,
Kamineni Institute of Medical Sciences, Narketpalli,
Telangana, India

Dr. Sridevi Mattaparti
Assistant Professor,
Department of Pathology,
Kamineni Institute of Medical Sciences, Narketpalli,
Telangana, India

Correspondence
Dr. Srinivas DD Gubbala
Associate Professor,
Department of Pathology,
Kamineni Institute of Medical Sciences, Narketpalli,
Telangana, India

Clinico-pathological evaluation and etiological stratification of chronic AUB patients based on PALM-COEIN classification: A prospective study in tertiary care center of Nalgonda District

Dr. Srinivas DD Gubbala and Dr. Sridevi Mattaparti

DOI: https://doi.org/10.33545/pathol.2019.v2.i1c.26

Abstract
Context: Abnormal uterine bleeding (AUB) is a common crippling gynaecological condition with vast financial implications. A structured approach for establishing the cause using the FIGO defined PALM-COEIN (Polyp, Adenomyosis, Leiomyoma, Malignancy (and hyperplasia), Coagulopathy, Ovulatory disorders, Endometrial, Iatrogenic and Not otherwise classified) classification system will facilitate accurate diagnosis and inform treatment options.
Aims and objectives: 1. Clinico-pathological evaluation of patients presenting with chronic AUB. 2. Etiological stratification of patients with chronic AUB in accordance to PALM-COEIN Classification. 3. To determine frequency of various uterine histopathological findings and their associated etiologies in the population of Nalgonda district.
Settings and Design: The present study was a cross-sectional prospective study conducted at the Department of pathology and Department of Obstetrics and Gynecology, Kamineni Institute of Medical Sciences, Narketpalli over a period of 2 years starting from June 2016 to June 2018.
Methods and Material: The study population included 188 cases of Chronic AUB. Specimens analysed were: 1. endometrial biopsy obtained by dilatation and curettage. 2. Hysteroscopy guided biopsy 3. Hysterectomy specimens. Histopathological evaluation of specimens was done and reported in accordance with PALM-COEIN classification.
Results: The commonest Age group involved was perimenopausal group (41-50) constituting (39.4%). Multiparous women most commonly presented with AUB accounting for 44.1% of all cases. Menorrhagia is the most common clinical presentation in reproductive age group (50.6%) and perimenopausal women (39.2%). Post-menopausal bleeding (36.0%) is commonest presentation in Post- menopausal age-group of AUB patients. Proliferative endometrium is the most common histological finding in reproductive age group (44.9%) and perimenopausal women (33.8%). Leiomyomas are the most common presentation is Post-menopausal women (32%). 4 Patients in the Post-menopausal Age group presented with Endometrioid Adenocarcinoma. According to PALM-COEIN classification AUB-E is the most common etiologic factor across all age groups. Non-structural causes account for 54.8% of AUB cases and among 45.2% of structural causes, Simple cystic hyperplasia is the most common histological finding.
Conclusions: AUB is a common and debilitating condition with high direct and indirect costs. Histopathological evaluation is the gold standard tool in the evaluation of the patients with Chronic AUB. A structured approach to establishing the cause using the FIGO PALM-COEIN classification system will facilitate accurate diagnosis and inform treatment options.

Keywords: Abnormal uterine bleeding (AUB), fibroids, FIGO PALM-COEIN classification of AUB

1. Introduction

Abnormal uterine bleeding (AUB) is a common gynaecological clinical entity having a significant impact on the physical, social, emotional and material quality of women's life [1]. AUB is defined as any type of bleeding in which the duration, frequency, or amount is excessive for an individual patient [2]. AUB is regarded as a sign of uterine disease or hormonal imbalance resulting pathology of hypothalamus-pituitary-ovarian axis [3]. According to the data published by National Health Portal the prevalence of AUB varies in each country fluctuating between 9-14% and in India the reported prevalence of AUB is around 17.9% [4]. AUB affects around 10-30% of Reproductive-aged female and up to 50% of perimenopausal women [5] Though there is relief from heavy menstrual bleeding during pregnancy and lactation, and an end to the problem at menopause, affected women suffer the

adverse impacts of AUB over the prime years of their lives incurring significant financial burden, necessitating adequate prompt management.

The management of AUB has been hindered for quite a long time owing to the confusion and inconsistency in nomenclature, lack of research and inadequate classification methods of various etiological criteria. In 2009 FIGO introduced a new nomenclature for AUB and defined PALM-COEIN classification (Table 1) for categorizing the causes of AUB in 2011 to facilitate ease of investigation, comparison of similar patient populations and improve evidence-based care [6]. Chronic AUB was defined as 'bleeding from the uterine corpus that is abnormal in volume, regularity and/or timing that has been present for the majority of the last 6 months' [7].

In the past many women with chronic AUB underwent unwarranted hysterectomy without a definite diagnosis. In view of increased availability of Medical options, proper etiological stratification in accordance to PALM-COEIN classification decreases the necessity of potentially complicated surgery.

The diagnosis of AUB depends on the comprehensive assessment of the medical history, combined with blood tests, ultrasound, hysteroscopic examination and histopathological analysis of specimens. Histopathological analysis plays a significant role in identification of structural causes of AUB and Non-Structural endometrial causes (AUB-E) and an adequate endometrial biopsy is of paramount importance in the evaluation of these patients.

With this background we initiated a prospective study to describe the prevalence of the various causes of chronic AUB in women of Nalgonda District and establish correlation with histopathological findings using the PALM-COIEN classification system.

2. AIMS and Objectives

1. Clinico-pathological evaluation of patients presenting with chronic AUB.
2. Etiological stratification of patients with chronic AUB in accordance to PALM-COEIN Classification.
3. To determine frequency of various uterine histopathological findings and their associated etiologies in the population of Nalgonda district.

3. Material and Methods

The present study was a cross-sectional prospective study conducted at the Department of pathology and Department of Obstetrics and Gynecology, Kamineni Institute of Medical Sciences, Narketpalli over a period of 2 years starting from June 2016 to June 2018. Prior informed consent was taken from all the patients and the study was approved by Institutional review board of kamineni Institute of medical sciences, Narketpalli. The study population included 188 cases of Chronic AUB. The causes of AUB in accordance with PALM-COEIN classification which can be correlated and determined by histopathological examination were included in the study and cases with other causes were excluded from the study.

3.1 Definitions used in the study

Acute AUB is defined as an episode of bleeding that is of sufficient quantity requiring immediate intervention to prevent further blood loss in a woman of reproductive age who is not pregnant.

Chronic AUB is defined as bleeding from the uterine corpus which is abnormal in duration, volume, and/or frequency and has been present for the majority of the last 6 months [8, 9]

3.2 Inclusion Criteria

1. Women aged 15 to 75 years
2. Women with Chronic AUB. Definition of Chronic AUB in our study is based on medical terms defined by FIGO, as shown in Table 2. Values out with the accepted 5-95th percentile indicated abnormal uterine bleeding.
3. Signed informed consent to participate in this study.

3.3 Exclusion Criteria

1. Acute AUB
2. Vaginal bleeding caused by pregnancy and pregnancy-related factors (Abortion, Ectopic pregnancy, Gestational trophoblastic diseases.)
3. Vaginal bleeding caused by cervical diseases.
4. Bleeding Diathesis.
5. Iatrogenic causes of AUB: Exogenous therapy leading to unscheduled endometrial bleeding (continuous oestrogen or progestin therapy (systemic or intrauterine delivery routes, gonadotropin-releasing hormone (GnRH) agonists, and Intrauterine device (IUD))

All women who consulted Gynaecological OPD with AUB were initially evaluated, Standard Menstrual index was prepared for all the patients which included 4 elements of menstrual bleeding: the frequency and regularity of the menstruation and menstrual cycle, the length of the period, duration of flow (days), and volume of monthly blood loss (millilitres) and patients with Chronic AUB are identified (Refer to Table 2). A structured screening for coagulopathies were done (Table 3) and history of drug intake was elicited.

Table 1: PALM-COEIN CLASSIFICATION for causes of Abnormal Uterine Bleeding(AUB) Proposed by International Federation of Gynaecology and Obstetrics(FIGO)

PALM (STRUCTURAL CAUSES)			COEIN (NON-STRUCTURAL CAUSES)		
P	AUB-P	Polyp	**C**	AUB-C	Coagulopathy
A	AUB-A	Adenomyosis	**O**	AUB-O	Ovulatory Disorders
L	AUB-L	Leiomyoma	**E**	AUB-E	Endometrial
M	AUB-M	Malignancy and Hyperplasia	**I**	AUB-I	Iatrogenic
			N	AUB-N	Not Otherwise Classified

Table 2: Suggested Normal limits for Menstrual Parameters. (Adapted from Fraser *et al*.) [6].

Clinical Parameter	Descriptive term	Normal limits(5–95th percentiles)
Frequency of menses (days)	Frequent	<24
	Normal	24–38
	Infrequent	>38
Regularity of menses, cycle to cycle	Absent	No bleeding
(Variation in days over 12 months)	Regular	Variation ± 2–20 days
	Irregular	Variation >20 days
Duration of flow (days)	Prolonged	>8.0
	Normal	4.5–8.0
	Shortened	<4.5
Volume of monthly blood loss (mL)	Heavy	>80
	Normal	5–80
	Light	<5

Patient information, such as age, height, weight, menarche age, medical and surgical history, and the results of relevant imaging examination and hysteroscopic examination, were obtained. Other lab investigations done were: CBP, ESR, coagulation studies (Bleeding time (BT), Clotting time (CT), Prothrombin Time (PT), Activated Partial Thromboplastin Time (APTT), liver function, renal function, sex hormone analysis.

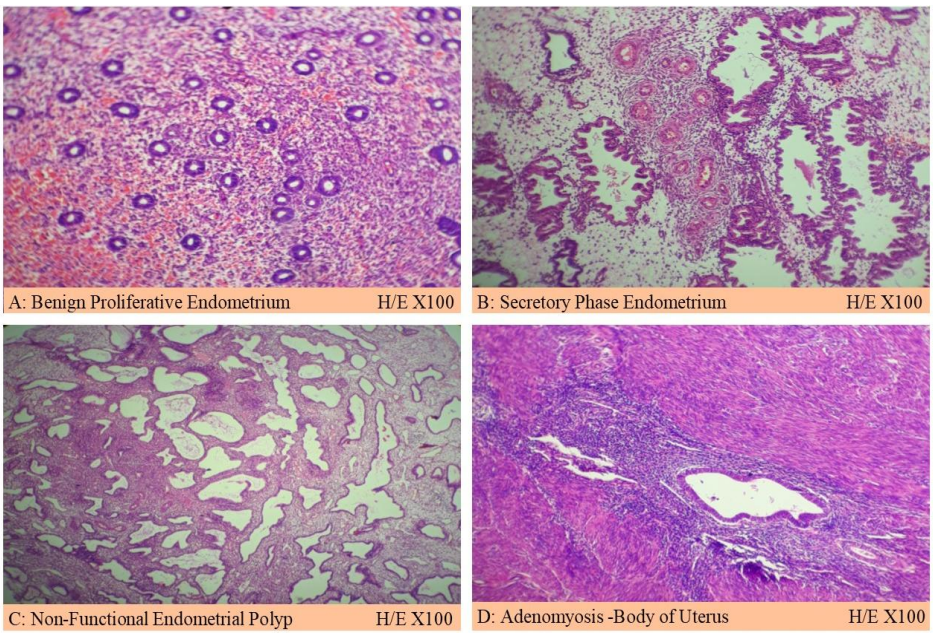
Table 3: Structured history for coagulopathy screen. (Adapted from Koudies *et al*.) [29].

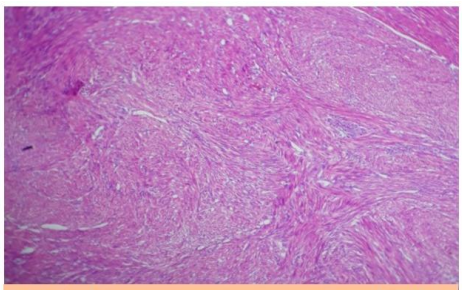
Criteria for Evaluation of Coagulopathy
1. Heavy bleeding since the menarche
2. One of the following:
▪ Postpartum haemorrhage
▪ Surgical-related bleeding
▪ Bleeding associated with dental work
3. Two or more of the following:
▪ Bruising 1–2 times/month
▪ Epistaxis 1–2 times per/month
▪ Frequent gum bleeding
▪ Family history of bleeding problems

3.4 Specimen Analysed: From patients with CHRONIC AUB were: 1. Endometrial biopsy obtained by dilatation and curettage. 2. Hysteroscopy guided biopsy-Endometrium and Polyps 3. Hysterectomy specimens of radiologically diagnosed fibroids and Adenomyosis. All specimens were processed in Yorco Automated tissue processor. Paraffin blocks were prepared and tissue sections of 3-5 microns were cut and were stained with haematoxylin and eosin stains (H&E) and examined by pathologist. Histo-morphological findings were reported and later stratified in accordance with PALM-COEIN classification and the data was expressed as percentage.

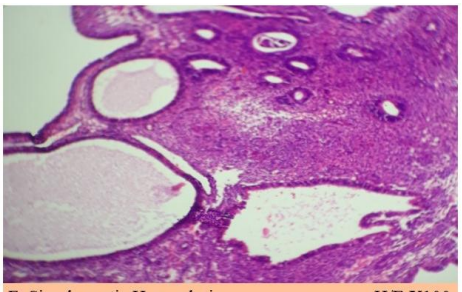
4. Observations/Results

4.1 Histopathological findings in Chronic AUB

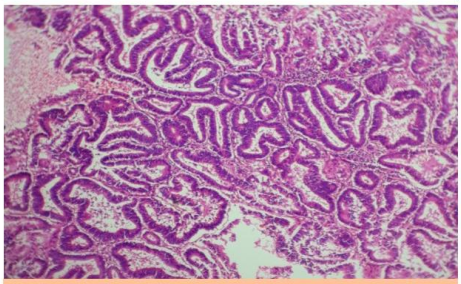




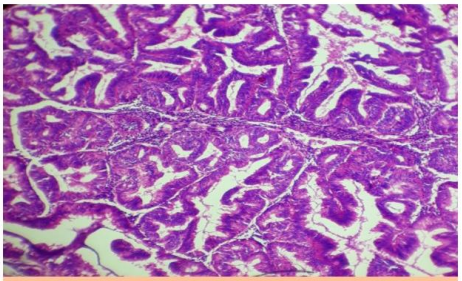
E: Uterine Leiomyoma H/E X100



F: Simple cystic Hyperplasia H/E X100

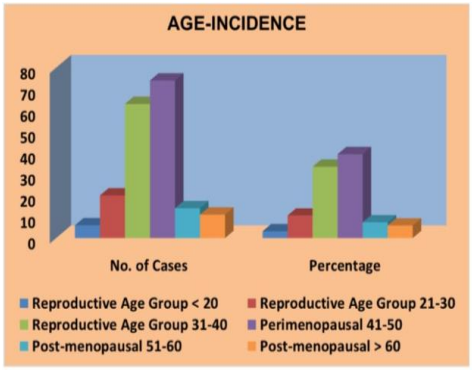


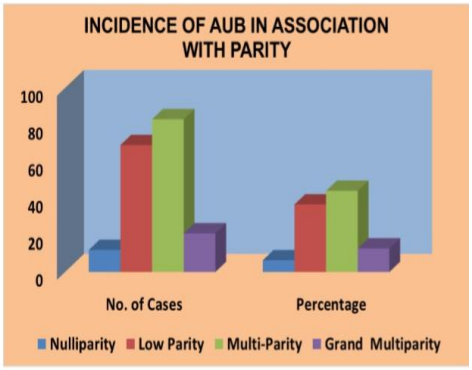
G:Complex Atypical Endometrial Hyperplasia H/E X100

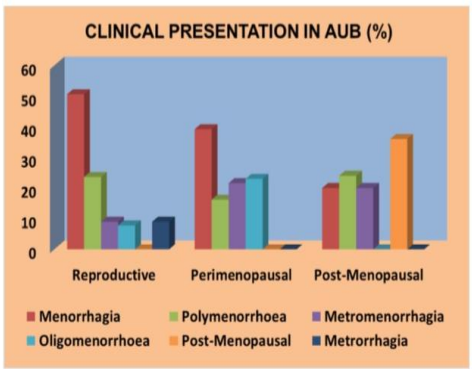


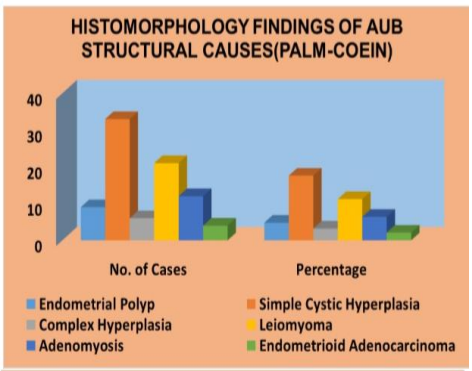
H: Endometrioid Adenocarcinoma H/E X100

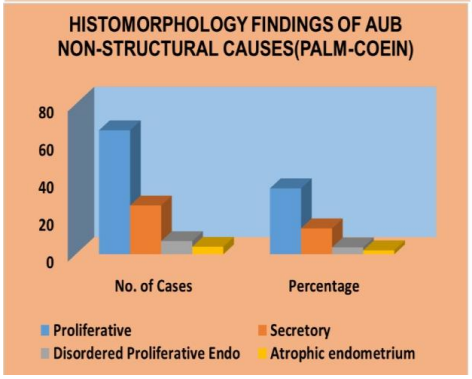
4.2 Graphical representation of the data

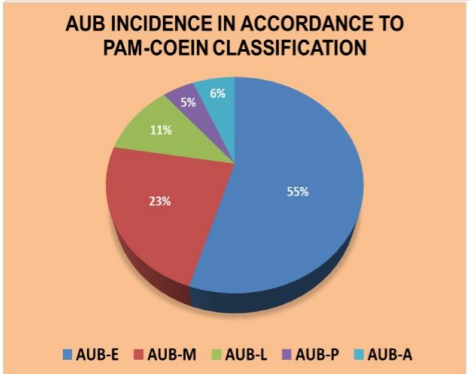












4.3 Statistics

Table 4: Age wise distribution of AUB patients

Category	Age group	No. of Cases	Percentage
Reproductive Age Group	< 20	6	3.2%
	21-30	20	10.6%
	31-40	63	33.5%
Perimenopausal	41-50	74	39.4%
Post-menopausal	51-60	14	7.4%
	> 60	11	5.9%
Total	Range 18-72 Yrs.	188	100%

Table 5: Distribution of AUB Patients based on Parity

Parity	No. of Cases	Percentage
Nulliparity	12	6.4%
Low Parity	69	36.7%
Multi-Parity	83	44.1%
Grand Multiparity	21	12.8%
Total	188	100%

Table 6: Age wise Distribution of clinical presentation in AUB Patients.

Clinical presentation	Reproductive Age (< 40 Yrs.)	Perimenopausal Age (41-50 Yrs.)	Post-Menopausal Age (> 50 Yrs.)	Total
Menorrhagia	45 (50.6%)	29 (39.2%)	05 (20.0%)	79 (42.0%)
Poly-menorrhoea	21 (23.6%)	12 (16.2%)	06 (24.0%)	39 (20.7%)
Menometrorrhagia	08 (9.0%)	16 (21.6%)	05 (20.0%)	29 (15.4%)
Oligomenorrhoea	07 (7.8%)	17 (23.0%)	0	24 (12.8%)
Post-Menopausal Bleeding	0	0	09 (36.0%)	09 (4.8%)
Metrorrhagia	08 (9%)	0	0	08 (4.3%)
TOTAL	89 (100%)	74 (100%)	25 (100%)	188 (100%)

Table 7: Age wise Distribution of Histopathological findings in AUB Patients

Histomorphology	Reproductive Age (< 40 Yrs.)	Perimenopausal Age (41-50 Yrs.)	Post-Menopausal Age (> 50 Yrs.)	Total
Proliferative	40 (44.9%)	25 (33.8%)	01 (4%)	66 (35.1%)
Secretory	19 (21.3%)	07 (9.5%)	0	26 (13.8%)
DPE**	05 (5.7%)	02 (2.7%)	0	07 (3.7%)
Atrophic	0	02 (2.7%)	02(8%)	04 (2.1%)
Simple cystic hyperplasia	13 (14.8%)	17 (22.9%)	03 (12%)	33 (17.6%)
Complex Hyperplasia	0	03 (4.1%)	03 (12%)	06 (3.2%)
Endometrioid Carcinoma	0	01 (1.3%)	03 (12%)	04 (2.1%)
Leiomyoma	04 (4.5%)	09 (12.2%)	08 (32%)	21 (11.2%)
Endometrial polyp	03 (3.4%)	04 (5.4%)	02 (8%)	09 (4.8%)
Adenomyosis	05 (5.6%)	04 (5.4%)	03 (12%)	12 (6.4%)
TOTAL	89 (100%)	74 (100%)	25 (100%)	188 (100%)
DPE **: Disordered Proliferative Endometrium				

Table 8: Histopathological findings in accordance to PALM-COEIN Classification

Histomorphology	Palm-Coein Classification	Type	Number of Cases	Total
Proliferative	**Non-Structural**	AUB-E	66 (35.1%)	103 (54.8%)
Secretory		AUB-E	26 (13.8%)	
DPE**		AUB-E	07 (3.7%)	
Atrophic		AUB-E	04 (2.1%)	
Simple cystic hyperplasia	**Structural**	AUB-M	33 (17.6%)	85 (45.2%)
Complex Hyperplasia		AUB-M	06 (3.2%)	
Endometrioid Carcinoma		AUB-M	04 (2.1%)	
Leiomyoma		AUB-L	21 (11.2%)	
Endometrial polyp		AUB-P	09 (4.8%)	
Adenomyosis		AUB-A	12 (6.4%)	
		TOTAL	188 (100%)	188 (100%)
Note: AUB-E: Abnormal Uterine bleeding -Endometrial causes, **AUB-M:** Abnormal Uterine				
Bleeding-Malignancy including hyperplasia, **AUB-L:** Abnormal uterine bleeding-Leiomyoma,				
AUB-P: Abnormal uterine bleeding-Polyp**, AUB-A:** Abnormal uterine bleeding-Adenomyosis				
DPE **: Disordered Proliferative Endometrium				

4.4 Interpretation of the Results

Table 4: Age of the patients ranged from 18-71 yrs. The commonest age group involved is the perimenopausal group (41-50) constituting 39.4% of total presented cases Second commonest age group was Fourth decade (31-40) and the least common age group was less than 20 years constituting only 3.2% of total cases.

Table 5: Multiparous women most commonly presented with AUB accounting for 44.1% of all cases. There is limited representation of grand multipara in our study and hence the lower incidence of AUB in that group of patients (12.8%).

Table 6: Menorrhagia was the most common clinical presentation in the patients of reproductive age group (50.6%) and perimenopausal group (39.2%). Least common presentation in the reproductive age group and perimenopausal group were Oligomenorrhoea (7.8%) and poly-menorrhoea (16.2%) respectively. Post-menopausal bleeding was present in 36.0% of cases in post-menopausal age group.

Table 7: Benign proliferative endometrium is the most common histo-morphological finding in the Reproductive age group (44.9%) and perimenopausal women (33.8%). Leiomyomas were the most common presentation in post-menopausal women (32%) Secretory endometrium was reported in 26 cases and majority of causes were in the reproduction age group. Disordered proliferative endometrium and Atrophic Endometrium were reported in 7 and 4 cases respectively. Among the endometrial hyperplasia, Simple cystic Hyperplasia was reported in 33 cases and constituted 84.6%. (33/39) of total cases which had microscopic evidence of endometrial hyperplasia. 4 patients in the post-menopausal age group presented with endometrioid adenocarcinoma and were associated with post-menopausal bleeding clinically. Leiomyomas were reported histologically on hysterectomy specimens and constituted 11.2% of total cases and majority of the cases were clustered in the perimenopausal and post-menopausal age group. Endometrial polyps were reported in a 9 cases and majority (4/9) around 44% were seen in the perimenopausal women. Adenomyosis was reported in 12 cases and the cases were distributed evenly among all age groups.

Table 8: According to PALM-COEIN classification Normal cyclical changes of Endometrium (AUB-E) is the most common etiologic factor across all age groups. Non-structural causes of AUB account for 54.8% of cases and among structural causes (45.2%), Simple cystic hyperplasia in the most common histopathological finding and Endometrioid adenocarcinoma was reported in 4 cases, constituting (2.1%) of all structural causes.

5. Discussion

Chronic Abnormal uterine bleeding (AUB) is a common crippling gynaecological condition with vast financial implications [5]. AUB is excessive, erratic and abnormal bleeding due to intra-uterine pathology or hormonal imbalance resulting from pathology involving hypothalamus-pituitary-ovarian axis [3]. With increased availability of medical options and individualised treatment protocols, accurate diagnosis in accordance to PALM-COEIN classification will help the clinician and has also expanded the choice for women and they no longer need to recourse to potentially complicated surgery. Histopathological analysis plays a significant role in identification of structural causes of AUB and Non-Structural endometrial causes (AUB-E) and an adequate endometrial biopsy is of paramount importance in the evaluation of these patients. Hysterectomy specimens were analysed in our study in cases of endometrial hyperplasia, endometrial carcinomas and radiologically diagnosed cases of leiomyoma to rule out sarcomatous change.

In our study there is clustering of cases (39%) in the perimenopausal period probably resulting from reduction in the number of ovarian follicles, gonadotropin resistance and resultant low levels of oestrogen. These findings correlated with studies done by Abdullah *et al.* and Saraswathi D *et al.* who reported similar incidence of 32.1% and 33.5% respectively in the perimenopausal women [10, 11].

Parity had significant affect and increased incidence of AUB was reported in multiparous women (44.1%). These findings were concordant with figures reported by Mahmoud *et al.* [12]. In our study there is limited representation of grand multipara and hence the lower incidence in this group (12.8%). This was a major limitation of our study. Majority of the AUB cases in our study presented with menorrhagia in reproductive age group (50.6%) and perimenopausal group (39.2%) and these findings were consistent with reference studies done by Sajitha *et al*. [13].

Palm Coein Classification defined by FIGO was incorporated in our study to facilitate stratification of etiological causes and establish correlation with histopathological findings. In our study structural and Non-structural causes reported were 45.2% and 54.8% respectively. These figures were concordant with studies done by Mirza *et al.* (Non-structural: 57% and structural: 43%) and Mahmoud *et al.* (Non-structural: 61.3% and structural: 38.7%) [12, 14].

5.1 AUB-E: AUB that occurs in the context of a structurally normal uterus with regular menstrual cycles without evidence of coagulopathy is likely to have an underlying endometrial cause. AUB-E may be implicated in many women with AUB, but a lack of clinically available specific tests or biomarkers means that practical testing for such disorders is not yet feasible. Diagnosis depends on careful history taking and exclusion of other contributors. Histopathological analysis of specimens in our study reveal normal cyclical endometrium with proliferative phase being the most common presentation reported in 35.1% of cases with clustering of cases in reproductive age group. Secretory phase endometrium was present in 13.8%, These findings were consistent with the study done by Abdullah LS *et al.* (10) Other reference studies revealed concordant results as a study by Riaz *et al.* revealed proliferative endometrium in 33% of cases study [15]. Disordered proliferative endometrium was reported in 3.7% and atrophic endometrium in 2.1% of cases and these findings were consistent with findings in study done by Jetley *et al.* (16) Lower incidence was reported in study by Saraswathi *et al.* (21.78%) and discordance may be due to selection criteria s and timing of endometrial biopsy. (11) AUB in these cases which represent Non-Structural/Functional causes in PALM-COEIN Classification are a result of hormonal imbalance due to pathology involving hypothalamus-pituitary-Ovarian axis leading to intermittent anovulatory

cycles, progressive rise of oestrogen resulting in feed-back inhibition by pituitary and eventual sudden fall in oestrogen. All these patients benefit form hormone-manipulation techniques.

5.2 AUB-P: Endometrial polyps which present structural/Organic causes of PALM-COEIN classification are formed due to prolonged oestrogen stimulation resulting in hyperplasia of basal endometrial layer. Endometrial polyps were reported in 4.8% of cases in our study and majority (44%) were in the perimenopausal age group. These finding were consistent with reference studies (Sarwat Ara *et al.* (4.2%) and Forae and Aligbe (3.0%) [17, 18]. Clustering of cases in perimenopausal age group was also concordant with reference studies by Saraswathi D *et al.* (39.1%) and by Jairajpuri ZS *et al.* (54.5%) [11, 19].

5.3 Adenomyosis (AUB-A): In our study adenomyosis was reported in 6.4% of cases. These findings correlated with work done by Yu Sun *et al.* which revealed figures of 4.94%. [20] Uterine adenomyosis is one cause of AUB and the incidence of AUB-A is 20% to 35% [21-23]. Previous study has rarely reported AUB caused by uterine adenomyosis as standard criterion for the histological diagnosis of uterine adenomyosis has inevitable limitations. Therefore, the prevalence of AUB-A in AUB is not clear.

5.4 AUB-L (leiomyoma): Leiomyomas were reported in hysterectomy specimens of 21 cases of AUB, constituting 11.2% of total cases. These findings were concordant with study done by Yu Sun *et al.* which reported an incidence of 12.35% [20]. There is still lack of data on the proportion of AUB-L in AUB as many of the previous studies concentrated on histopathology of endometrial biopsy alone in evaluation of AUB and did not adequately evaluate hysterectomy specimens. Few studies done had indicated that incidence of AUB caused by AUB-L ranged between 14%-25% [24, 25]. The cause of AUB in patients with fibroids remains incompletely understood. Previous postulated theories include an increased endometrial surface area and the presence of fragile and engorged vasculature in the peri-myoma environment [26]. The increase in vascular flow observed along with these enlarged vessels can overcome platelet action [27]. There is increasing knowledge regarding the complex cellular and molecular changes found in association with fibroids, with impact on angiogenesis, alteration in vasoactive substrates and growth factors as well as alteration in coagulation [27]. Our study found that the incidence of AUB-L increased with age and majority of cases are in the perimenopausal and post-menopausal age group.

5.5 AUB-M (Malignancy and Hyperplasia): In our study simple cystic Hyperplasia was reported in 17.6% of cases which correlated with study done by Riaz S *et al.* which had figures of 25.0%. [15] Complex Hyperplasia were reported in 3.2% of cases and these figures were similar to the findings of 2.8% reported in the study done by Khan S *et al.* [28] Amongst endometrial hyperplasia, complex hyperplasia comprised 15.38% of cases and study done by Mahmoud *et al.* reported figures of 28.7%. (12%) The minor differences between these studies may be due variation in selection of cases and prompt initiation of hormonal therapy. Endometrial Hyperplasia is the pre-cursor of carcinoma and results due to anovulatory cycles with persistent un-ripened follicles exposing endometrium to prolonged estrogenic stimulation. Endometrial carcinoma is the significant histopathological finding in our study but with least incidence (2.1%) All cases were associated with postmenopausal bleeding. These findings were consistent with results of Abdullah LS *et al.* (1.8%) and Riaz s *et al.* (1.0%) [10, 15].

Thus, our study which involved histopathological evaluation and etiological stratification of cases with AUB based on PALM-COEIN classification succeeded in determining the prevalence in our population and provided our clinicians and authorities with the data to work on and plan therapy for efficient management of AUB.

6. Conclusion

1. In our study majority of cases of Abnormal Uterine Bleeding were due to hormonal imbalance in the setting of Normal cyclical endometrium (AUB-E) and predominantly presented in the reproductive age group which represented the Non-structural causes of PALM-COEIN Classification. These cases can be managed by hormone manipulation therapy thereby excluding the need for unwanted hysterectomy. Among the structural causes, simple cystic hyperplasia was the major contributor and these patients also benefit from medical management.
2. In view of presence of reported cases of endometrial hyperplasia and carcinoma in our study endometrial sampling/biopsy has emerged as a gold standard in the evaluation of patients with chronic AUB.
3. The role of Hysterectomy in patients with Chronic AUB should be restricted to endometrial hyperplasia, endometrial carcinoma and for ruling out Malignant transformation/malignancy in Leiomyomas due to limitations of Imaging techniques (MRI).
4. With increased availability of medical options and individualised treatment protocols, accurate diagnosis in accordance to PALM-COEIN classification will help the clinician a great deal and has also expanded the choice for women as now they no longer need to recourse to potentially complicated surgery.
5. Our study would provide statistical data to the Government and administrative authorities to plan patient education, construct robust screening programs for effective management of patients with chronic AUB.

7. Source of Funds: None Declared.
8. Conflict of Interest: None Declared.

9. References

1. NICE. Clinical Guideline 44; Heavy menstrual bleeding National Institute for Health and Clinical Excellence (NICE), 2007. Available at: http://www.nice.org.uk/nicemedia/pdf/ CG44 FullGuideline.pdf.
2. Munro MG, Critchley HO, Fraser IS. The flexible FIGO classification concept for underlying causes of abnormal uterine bleeding. Semin Reprod Med. 2011; 29:391-9.
3. Practice bulletin no. 128: diagnosis of abnormal uterine bleeding in reproductive aged women. Obstet Gynecol. 2012; 120:197-206.

4. Abnormal uterine Bleeding/ National Health Portal of India. Available at: nhp.gov.in/disease/gynaecology-and-obstetrics/abnormal uterine bleeding.
5. Mary GS, Tarin AS, Patrice MW. Evaluation and management of abnormal uterine bleeding in premenopausal women. Am Fam physician. 2012; 85(1):35-43
6. Fraser IS, Critchley HO, Broder M. The FIGO recommendations on terminologies and definitions for normal and abnormal uterine bleeding. Semin Reprod Med. 2011; 29:383-390.
7. Munro MG, Critchley HO, Fraser IS. For the FIGO Working Group on Menstrual Disorders. FIGO classification of causes of abnormal uterine bleeding. Int. J Gynaecol Obstet. 2011; 113:1-2.
8. DeVore GR, Owens O, Kase N. Use of intravenous Premarin in the treatment of dysfunctional uterine bleeding-a double-blind randomized control study. Obstet Gynecol. 1982; 59:285-91.
9. Munro MG, Mainor N, Basu R *et al*. Oral medroxyprogesterone acetate and combination oral contraceptives for acute uterine bleeding: a randomized controlled trial. Obstet Gynecol. 2006; 108:924-9.
10. Abdullah LS, Bondagji NS, Histopathological pattern of endometrial sampling performed for abnormal uterine bleeding. Bahrain Med Bull. 2011; 33(4):1-6.
11. Saraswathi D, Thanka J, Shalinee R, Aarthi R, Jaya V, Kumar PV. Study of endometrial pathology in abnormal uterine bleeding. Obstet Gynaecol India. 2011; 61:424430.
12. Mahmoud MM, Aseel GR. Endometrial Histopathological changes in women with abnormal uterine bleeding in Kirkuk City, A Clinicopathological study. Med J of Babylon. 2013; 10:567-582.
13. Sajitha K, Shetty K, Hegde P, Kishan Prasad H, Padma S, Permi H. Study of histopathological pattern of endometrium in abnormal uterine bleeding. CHRISMED journal of health and Research. 2014; 1(2):76-81.
14. Mirza T, Akram S, Mirza A *et al*. Histopathological pattern of abnormal uterine bleeding in endometrial biopsies. 2012; 8:114-117.
15. Riaz S, Ibrar F, Dawood Ns, Jabeen A. Endometrial pathology by endometrial curettage in menorrhagia in premenopausal age group. J Ayub Med Coll Abottabad.. 2010; 22(3):161-164.
16. Jetley S, Rana S, Jairajpuri ZS. Morphological spectrum of endometrial pathology in middle aged women atypical uterine bleeding. J of Midlife. 2013; 4(4):216-220.
17. Sarwat Ara, Roohi M. Abnormal uterine bleeding; Histopathological diagnosis by conventional dilatation and curettage, Professional Med J. 2011; 18(4):587-591.
18. Forae GD, Aligbe JU. Histopathological pattern of endometrial lesions in patients with abnormal uterine bleeding in a cosmopolitan Population. J Basic clin Reprod Sci., 2013; 2(2):101-104.
19. Jairajpuri ZS, Rana S, Jetley S. Atypical uterine bleeding histopathological audit of endometrium. A study of 638 cases. Al Ameen J Med Sci. 2013; 6(1):21-28.
20. Yu Sun, MSc, Yuzhu Wang, MSc, Lele Mao, PhD. Prevalence of abnormal uterine bleeding according to new International Federation of Gynaecology and Obstetrics classification in Chinese women of reproductive age A cross-sectional study. Medicine (Baltimore). 2018; 97(31):e11457.
21. Weiss G, Maseelall P, Schott LL *et al*. Adenomyosis a variant, not a disease? Evidence from hysterectomized menopausal women in the Study of Women's Health across the Nation (SWAN). Fertil Steril. 2009; 91:201-6.
22. Dueholm M. Transvaginal ultrasound for diagnosis of adenomyosis: a review. Best Pract Res Clin Obstet Gynaecol. 2006; 20:569-82.
23. Bergholt T, Eriksen L, Berendt N *et al*. Prevalence and risk factors of adenomyosis at hysterectomy. Hum Reprod. 2001; 16:2418-21.
24. Fraser IS, Langham S, Uhl-Hochgraeber K. Health-related quality of life and economic burden of abnormal uterine bleeding. Expert Rev Obstet Gynecol. 2009; 4:179e89.
25. Shapley M, Jordan K, Croft PR. An epidemiological survey of symptoms of menstrual loss in the community. Br J Gen Pract. 2004; 54:359e63.
26. Munro MG. Classification of menstrual bleeding disorders. Rev Endocr Metab Disord. 2012; 13:225-234.
27. Stewart EA, Nowak RA. Leiomyoma-related bleeding: a classic hypothesis updated for the molecular era. Hum Reprod Update. 1996; 2:295-306.
28. Khan S, Hameed S, Umber A. Histopathological pattern of endometrium on diagnostic D&C in patients with abnormal uterine bleeding. Annals. 2011; 17(2):166-170.
29. Kouides PA, Conard J, Peyvandi F. Hemostasis and menstruation: appropriate investigation for underlying disorders of hemostasis in women with excessive menstrual bleeding. Fertil Steril. 2005; 84:1345-1351.