Prevalence of Abnormal Uterine Bleeding According to the International Federation of Gynecology and Obstetrics Classification (PALM-COEIN) Among Reproductive-aged Women Admitted in a Tertiary Hospital in Las Piñas

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Objective: To determine the prevalence of the causes of abnormal uterine bleeding based on the FIGO (PALM-COEIN) Classification, among patients admitted at a tertiary hospital in Las Pinas City

Methods: A cross sectional (retrospective) study was done. Patients aged 15-50 years old who were admitted due to abnormal uterine bleeding from January 2017 to December 2019 were included. Patients with AUB due to pregnancy, vaginitis, bleeding before menarche, and bleeding after menopause were excluded from the study. Patient's data as to age, obstetrical score, co-morbidity, bleeding patterns were tabulated.

Results: A total of 455 subjects were included in the study. Results showed that the most common causes of abnormal uterine bleeding among admitted patients in Perpetual Help Medical Center Las Piñas from January 2017 – December 2019 were due to structural causes (91%). Most prevalent was bleeding due to polyps (50.5%), followed by adenomyosis (18.8%), leiomyoma (16.04%), and malignancy (6.2%). Prevalence of non-structural causes of bleeding was 0.4% for coagulopathy, 3.3% due to ovulatory dysfunction, 4.6% due to endometrial dysfunction, and 0.2% for AUB-N.

Conclusion: Based on this 3-year retrospective study, structural causes are the most common causes of AUB, comprising about 91% of all patients admitted for AUB. The most common structural causes are AUB-P (50.5%), followed by AUB-A, AUB-L and AUB-M. Prompt recognition of the causes of AUB is very important, to prevent complications such as severe anemia and shock. Proper treatment, be it surgical or medical, also depends on the exact cause of AUB.

Key words: abnormal uterine bleeding, polyps, adenomyosis

Introduction

Abnormal Uterine Bleeding (AUB) is a major gynecologic problem worldwide, and is defined as any type of bleeding in which the duration, frequency, or amount is excessive for an individual.[1] The International Federation of Gynecology and Obstetrics (FIGO) Classification System (PALM-COEIN) for causes of Abnormal Uterine Bleeding was first proposed in 2011 by the group of Professor Munro and has been updated in 2018[2], mainly concerning terminologies, definitions and underlying causes of AUB in reproductive years. Table 1 shows the   FIGO PALM-COIEN classification of AUB among non-pregnant reproductive-aged women.

Table 1. FIGO PALM-COIEN classification of abnormal uterine bleeding.

PALM (Structural)	COEIN (Non-structural)
P – Polyp	C – Coagulopathy
A – Adenomyosis	O – Ovulatory Dysfunction
L – Leiomyoma	E – Endometrial
M - Malignancy	I – Iatrogenic
	N –Not yet classified

In a cross-sectional study done by Yu Sun, et al. in 2008[3] entitled "Prevalence of Abnormal Uterine Bleeding According to the FIGO Classification in Chinese Women of Reproductive Age", a total of 1053 women aged 15 to 55 with abnormal uterine bleeding were evaluated. According to the study, ovulatory dysfunction (AUB-O) was the most common cause of AUB among non-structural causes, and AUB-P among structural causes.

Based on the Clinical Practice Guidelines on Abnormal Uterine Bleeding of the Philippine Obstetrical and Gynecological Society (POGS)[4], the normal limits for menstrual parameters in the mid-reproductive years are tabulated below:

In 2018, modifications were made in the FIGO Classification as detailed below.[2]

This study aimed to determine the prevalence of the causes of AUB in Perpetual Help Medical Center Las Piñas for the years 2017 to 2019.

The objective of the study was to determine the prevalence of the causes of abnormal uterine bleeding based on the updated FIGO (PALM-COEIN) Classification, among patients admitted in Perpetual Hospital Medical Center in Las Piñas.

Materials and Methods

A cross-sectional (retrospective) study was done. Patients were between 15-50 years old and admitted due to abnormal uterine bleeding, including any of the following: menstrual cycle of < 24 days or >38 days; irregularity of menses, cycle to cycle variation of > 20 days during 12 months; duration of flow of > 8 days or < 4 days; volume of monthly blood loss > 80ml or < 5ml from January 2017 to December 2019 were included in the study. Patients with AUB due to pregnancy, vaginitis, bleeding before menarche, and bleeding after menopause

Table 2. Normal limits for menstrual parameters.

Clinical Dimensions of Menstruation and Menstrual cycle	Descriptive terms	Normal limits (5th-95th percentiles)
Frequency of menses (days)	Frequent Normal Infrequent	<24 24-38 >38
Regularity of menses (cycle to cycle variation over 12 months; in days)	Absent Regular Irregular	- Variation of +/- 2 to 20 days Variation >20 days
Duration of flow (days)	Prolonged Normal Shortened	> 8.0 4.5-8.0 <4.5
Volume of monthly blood loss (ml)	Heavy Normal Light	>80 5-80 <5

Table 3. Updated FIGO classification of AUB.

System 2 Category	Modification
AUB – Adenomyosis	Refined sonographic diagnostic criteria
AUB – Leiomyoma	Inclusion of type 3 as a submucus myoma
AUB – Coagulopathy	No longer includes AUB associated with pharmacologic agents that impair blood coagulation which are now included in AUB-I
AUB – Iatrogenic	includes AUB associated with all iatrogenic processes including the use of pharmacological agents used for anticoagulation and those thought to interfere with ovulation
AUB - B – Not yet classified	The name of the category has been changed from "Not Yet Classified" to Not Otherwise Classified

were excluded from the study. Patient data including age, obstetrical score, comorbidities, and bleeding patterns were noted and tabulated.

Sample Size

According to Yu Sun, et al. (2018), the prevalence of structural cause of chronic abnormal uterine bleeding was 35.42% and non-structural causes of abnormal uterine bleeding accounts for 64.58% of cases. Using this data, a minimum sample size of 278 subjects was calculated (using OpenEpi) to estimate the expected proportion of abnormal uterine bleeding using the FIGO classification, with a 95% confidence level and a margin of error of ± 5%.

Results

There were 455 cases of AUB included in the study. Ninety one percent (416/455) of the total number of cases are due to structural causes of AUB. The prevalence of the causes of abnormal uterine bleeding using the FIGO classification (PALM-COEIN) among patients admitted between January 2017 and December 2019 is shown in Table 4.

Based on the data collected, the top 4 most common causes of AUB during this time were due to AUB-P, accounting for 50.5% (230 subjects), followed by AUB-A (18.8%), AUB-L (16.04%), and AUB-M (6.2%). These were based on the final diagnosis and/or histopathologic results (if patient underwent surgery).

The bleeding patterns of these women admitted due to the major causes of AUB are shown in Table 5. Women admitted due to AUB-P mostly

Table 4. Frequency of AUB according to etiology.

AUB Classification	Frequency	%
AUB-P (Polyp)	230	50.5%
AUB-A (Adenomyosis)	85	18.8%
AUB-L (Leiomyoma)	73	16.04%
AUB-M (Malignancy/Hyperplasia)	28	6.2%
AUB-C (Coagulopathy)	2	0.4%
AUB-O (Ovulatory)	15	3.3%
AUB-E (Endometrial)	21	4.6%
AUB-I (Iatrogenic)	0	0%
AUB-N (Not otherwise classified)	1	0.2%
TOTAL	455	100%

presented with prolonged vaginal bleeding. Those with AUB-A, AUB-L and AUB-M mostly presented with prolonged and heavy vaginal bleeding.

Figure 1 shows the age distribution of the 4 major causes of AUB in this study. For AUB-P, the highest prevalence was noted in the age range of 41 to 45 years old, followed by 36 to 40 years old. For AUB-A, the highest prevalence was likewise noted in the age range of 41 to 45 years old, followed by 46 to 50 years old. For AUB-L, highest prevalence was noted in the age range of 46 to 50 years old, followed by 41 to 45 years old. For AUB-M, highest prevalence was noted in the age range of 36 to 40 years old, followed by age range of 46 to 50 years old.

Discussion

Abnormal uterine bleeding (AUB) is one of the major medical concerns in the field of Obstetrics and Gynecology. It can present with different patterns of

Table 5. Bleeding patterns of women with AUB-P, AUB-A, AUB-L, AUB-M.

|		AUB-P	AUB-A	AUB-L	AUB-M
Frequency	Frequent	12.2% (28/230)	10.6% (9/85)	30.1% (22/73)	32.1% (9/28)
	Normal	87.8% (202/230)	89.4% (76/85)	67.2% (49/73)	67.9% (19/28)
	Infrequent	0% (0/230)	0% (0/85)	2.7% (2/73)	0% (0/28)
Regularity of menses	Absent	0% (0/230)	0% (0/85)	0% (0/73)	0% (0/28)
	Regular	93.9% (216/230)	83.5% (71/85)	72.6% (53/73)	89.3% (25/28)
	Irregular	6.1% (14/230)	16.8% (14/85)	27.4% (20/73)	10.7% (3/28)
Duration of flow	Prolonged	65.7% (151/230)	51.8% (44/85)	50.7% (37/73)	57.1% (16/28)
	Normal	34.3% (79/230)	48.2% (41/85)	49.3% (36/73)	42.9% (12/28)
	Shortened	0% (0/230)	0% (0/85)	0% (0/73)	0% (0/28)
Volume of blood loss	Heavy	36.1% (83/230)	50.6% (43/85)	67.1% (49/73)	53.6% (15/28)
	Normal	63.9% (147/230)	49.4% (42/85)	30.1% (22/73)	42.9% (12/28)
	Light	0% (0/230)	0% (0/85)	2.7% (2/73)	3.5% (1/28)
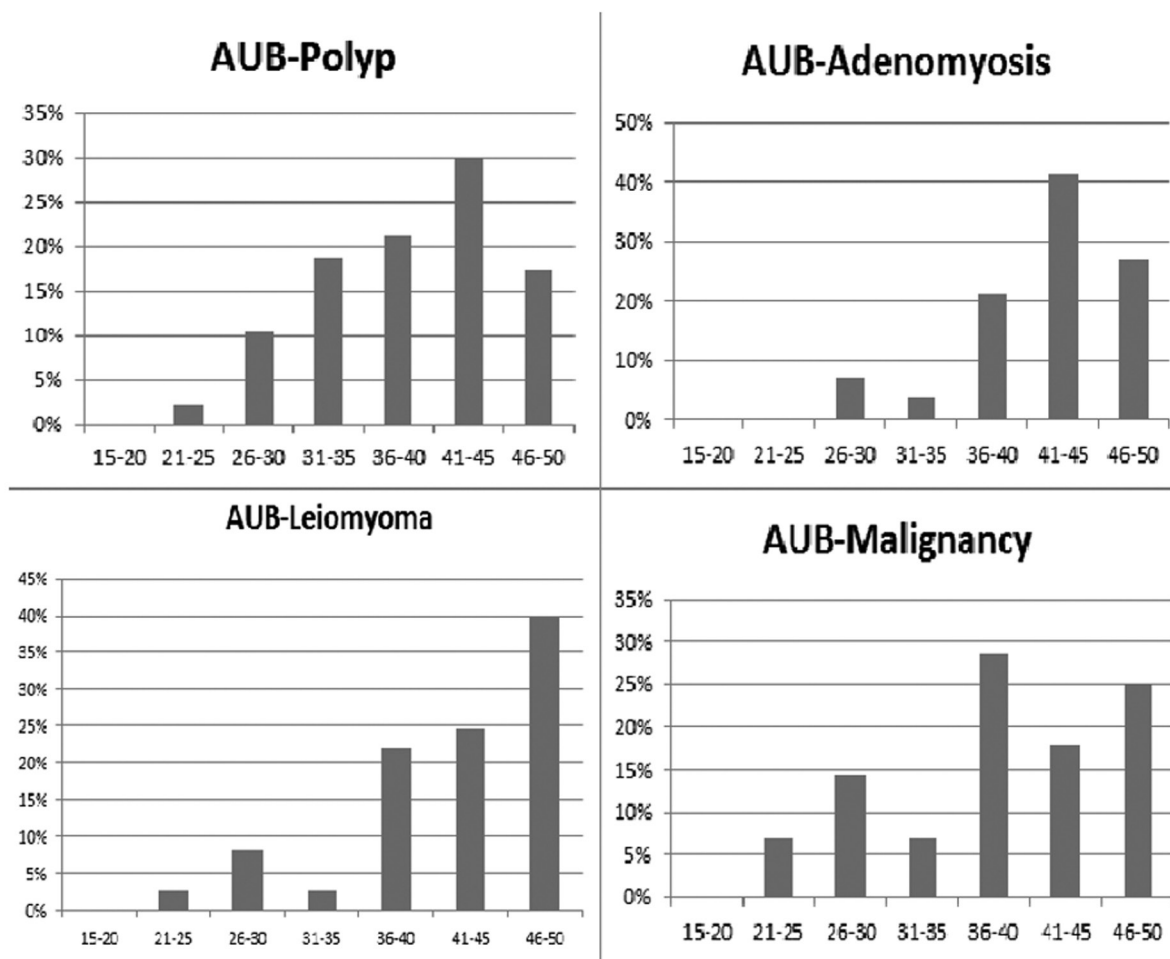
Figure 1. Age distribution of the major causes of AUB.

bleeding, ranging from absent to prolonged cycles, from frequent bleeding to infrequent episodes, and from scanty bleeding to heavy menstrual flow. Though the diagnosis may be challenging, determining the exact etiology is imperative, to promptly administer the correct treatment and avoid complications of misdiagnosis.

The International Federation of Gynecology and Obstetrics (FIGO) Classification System 2 (PALM-COEIN) for causes of AUB was proposed in 2011 and has been applied internationally in the diagnosis of AUB. In 2018, a study was made by Yu Sun, et al.[3] on the prevalence of AUB among Chinese women between 15-55 years old using the FIGO Classification. Results showed that non-structural causes were the most common causes of AUB, with ovulatory dysfunction (AUB-O) being the most prevalent (57.7%). This was followed by

AUB-P, which was the most common structural cause, with a prevalence of 16.2%. In contrast, this study showed that among the 455 women admitted in Perpetual Help Medical Center Las Piñas for AUB, the most prevalent cause was due to structural causes (91%), with AUB-P as the most common, followed by AUB-A, AUB-L and AUB-M.

Polyps (AUB-P) are benign overgrowths of endometrial tissue, containing glands, stroma, and blood vessels covered with epithelium.[1] Symptomatic polyps can be treated safely and effectively with operative hysteroscopy. In this study, 87.8% of those diagnosed with polyps (202 out of 230 patients) underwent curettage. Only 9.57% (22 out of 230) of the patients were surgically treated using hysteroscopy-guided polypectomy, 1.74% (4 out of 230) underwent endocervical polypectomy, and 0.43% (1 out of 230) underwent hysterectomy.

Adenomyosis (AUB-A) is the presence of endometrial glands and stroma in the uterine myometrium. AUB due to adenomyosis is thought to be the result of altered uterine contractility and is commonly associated with profound dysmenorrhea.[1] The sonographic features pathognomonic of adenomyosis include an enlarged, asymmetric uterus and anechoic avascular cysts scattered in the myometrium.[1] On MRI, adenomyosis will demonstrate thickening of the junctional zone equal to or greater that 12mm.[2] The choice of treatment depends on the patient's age, reproductive status, and clinical symptoms. In this study, 58 subjects (68.2%) diagnosed with adenomyosis underwent hysterectomy and diagnosis was confirmed on histopathologic analysis. Seventeen (31.8%) were admitted for blood transfusion. The diagnosis of adenomyosis for these patients were based on history, physical examination, and sonographic findings.

Leiomyoma (AUB-L) are benign tumors of the uterine myometrium. It is said to be a result of myometrial injury leading to cellular proliferation, decreased apoptosis, and increased production of extracellular matrix.[1] AUB caused by leiomyoma depends on the fibroid size, location, and number. Treatment includes hormonal, surgical ablation of the endometrium, uterine artery embolization, radiofrequency ablation, myomectomy, and hysterectomy. In this study, out of the 73 patients diagnosed with leiomyoma, 67.12% underwent hysterectomy, 12.33% underwent hysteroscopy-guided myomectomy, 6.85% underwent abdominal myomectomy, and 1.4% underwent vaginal myomectomy. Nine patients (12.33%) diagnosed with leiomyoma were admitted for correction of anemia and underwent blood transfusion.

AUB due to malignancies (AUB-M) include vulvar, vaginal, cervical, endometrial, uterine, fallopian tube, and ovarian cancers.[1] Endometrial hyperplasia is also included in this category. Management depends on the type of pathology. In this study, 28 cases were categorized under AUB-M. Fifteen (53.6%) subjects had simple hyperplasia, 8 (28.6%) had complex hyperplasia with atypia, 1 (3.6%) had complex hyperplasia without atypia, and 4 patients with endometrial adenocarcinoma. Out of the 28 patients, 4 underwent hysterectomy and the rest underwent curettage, with subsequent medical management. These diagnoses were made after histopathologic analysis.

The category AUB-Coagulopathy (AUB-C) includes disorders of coagulation such as von Willebrand disease, prothrombin deficiency, and platelet disorders.[2] Adolescents presenting with heavy and prolonged vaginal bleeding starting menarche and those adults presenting with clinical signs of bleeding warrants investigation. In this study, 2 cases were identified under this category. Both had history of prolonged and heavy vaginal bleeding and were admitted for correction of anemia. One patient was an 18 year old who was a known case of Idiopathic Thrombocytopenic Purpura and the other was a 33 year old with Thalassemia.

Ovulatory dysfunction (AUB-O) cause abnormal bleeding usually seen in extremes of life – postmenarcheal and perimenopausal women, which may be due to neuroendocrine dysfuncton. There is a steady state of estrogen production leading to endometrial proliferation which outgrows its blood supply.[2,5] Anovulatory bleeding in the adolescent is usually caused by immaturity of the HPO axis or loss of positive feedback of estradiol to cause LH surge. In perimenopausal women, there is lack of synchronization in the HPO axis.[5] Patients diagnosed with AUB-O were mostly seen at the hospital's gynecology clinic, and thus were managed as outpatients. Those few patients with AUB-O that were included in this study were mostly admitted for blood transfusion and acute medical management. Fifteen patients were identified under this category.

Endometrial Dysfunction (AUB–E) or previously termed "Dysfunctional Uterine Bleeding" is heavy vaginal bleeding in women with no other identifiable causes. It may be due to abnormalities in platelet plug formation or imbalance between PGF2 alpha/PGE.[5] Iatrogenic (AUB-I) causes include medications such as selective estrogen receptor modulator, GnRH agonist, and antagonist, and anticoagulants such as heparin and warfarin.[2]

The category AUB-N (Not otherwise classified) comprises entities not included in the above groups. These include AV malformation, foreign bodies, and chronic endometritis. In this 3-year study, only one case was identified to fall under this category. This case was diagnosed with AV malformation. She was a 34 year old G1P1 (1001) who presented with prolonged and heavy vaginal bleeding. On

transvaginal ultrasound, AV malformation was suspected and was confirmed after the patient underwent hysterectomy.

Management of abnormal uterine bleeding depends on the cause of the bleeding and depends if the bleeding is acute or chronic. Acute bleeding necessitates immediate cessation of bleeding and possible replacement of blood loss.

Summary and Conclusion

In this study, structural causes are the most common causes of AUB, comprising about 91% of all patients admitted for AUB. The most common structural causes are AUB-P (50.5%), followed by AUB-A, AUB-L and AUB-M. Prompt recognition of the causes of AUB is very important, to prevent complications such as severe anemia and shock. Proper treatment, be it surgical or medical, also depends on the exact cause of AUB.

Recommendation

This study was limited to a 3-year retrospective study. The authors recommend a larger population and inclusion of patients from the outpatient clinic.

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