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Palm-Coein Classification of Abnormal Uterine Bleeding and Clinicopathological Correlation

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ABSTRACT

Background: AUB is a prevalent gynaecological condition that has a substantial effect on women's social, emotional, and physical health. AUB causes are systematically divided into structural (PALM) and non-structural (COEIN) components using the PALM-COEIN categorisation system, which was introduced by the International Federation of Gynaecology and Obstetrics (FIGO). Although it has been widely used, there are still issues with its clinical application and diagnostics, especially in areas with low resources. **Objective:** The objective of this study was to establish a clinicopathological connection, classifying AUB patients using the PALM-COEIN system, and evaluating treatment outcomes and diagnostic difficulties in women of reproductive age. **Methods:** Purposive sampling was used in a qualitative study including 160 women with an AUB diagnosis. Comprehensive patient interviews, clinical assessments, and histological examination of endometrial samples were all part of the data collection process. Trends in clinical presentations, histology results, and therapy responses were found using thematic analysis. **Findings:** Non-structural reasons (COEIN) made up 37.4% of cases, with ovulatory dysfunction (18.8%) being the most common, while structural causes (PALM) accounted for 62.6% of cases, with leiomyomas (21.9%) being the most common. Women between the ages of 31 and 40 had the highest frequency of AUB (40.6%). The most common histological finding (34.4%) was proliferative endometrium, which suggests that ovulatory disruption had a significant role. In postmenopausal individuals, endometrial hyperplasia (15%) and carcinoma (5.6%) were more prevalent. **Conclusion:** The PALM-COEIN categorisation system offered a methodical way to diagnose AUB, allowing for focused therapeutic approaches. Diagnostic difficulties still exist, nevertheless, particularly when there are overlapping characteristics or insufficient histopathological resources. To improve patient care outcomes and improve classification accuracy, more research is required, especially in settings with limited resources.

INTRODUCTION

AUB represents a common gynecological problem which impacts women between ages 15 to 49 who suffer from significant social and mental and physical consequences leading to diminished life quality (Singh K et al., 2020). The gynecology outpatient department encounters thirty percent to twenty percent AUB complaints among women within their reproductive years according to Jahan I et al. (2020). A woman with Acute AUB experiences a sudden bleeding episode that poses immediate danger to her blood loss control according to FIGO definition. Abnormal bleeding from the uterine corpus that exists throughout most of the last 6 months with unusual quantity and duration and frequency stands as a medical definition of chronic AUB (Bahamondes L et al., 2015). The condition of anemia develops due to AUB in premenopausal patients and simultaneously boosts cancer risk for postmenopausal patients (Inal ZO et al., 2017). The four primary clinical manifestations of bleeding disorder in patients include heavy menstrual bleeding known as menorrhagia and inter-menstrual bleeding known as menorrhagia as well as severe and protracted menstrual bleeding called menometrorrhagia and frequent menstrual bleeding referred to as polymenorrhoea (Munro MG et al., 2012). Female patients between childbearing and post-menopausal age can benefit from the PALM COEIN system established by the FIGO working group on menstrual disorders to identify causes of abnormal uterine bleeding. The PLM-COEIN acronym groups nine categories which form the basis of describing AUB causes according to Munro MG et al. (2012; Munro MG et al., 2011).

At its first phase AUB becomes responsive to medical therapy. Three minimally invasive surgical options include endometrial ablation together with thermal balloon therapy and uterine artery embolization which provide satisfactory medical alternatives to hysterectomy when medicine fails to help the patient (Kelekci S et al., 2005). The high costs and limited accessibility of minimally invasive procedures keep India among other developing nations performing hysterectomies as the prevalent surgical procedure. The examination of biopsies through histological methods helps doctors identify AUB causes which lead to proper patient treatment decisions (Guido RS et al., 1995)

Research suggests AUB symptoms are responsible for one-third of all gynecologist appointments yet less than half of affected patients get medical care leading to poor treatment satisfaction (Cote I et al., 2003).

The study of local AUB factors requires focused appropriate treatment after empirical therapy to reduce AUB complications and improve patient quality of life.

Further research along with PALM-COEIN system data collection needs to be done to establish standardized approaches for PALM-COEIN since it has widespread use.

The purpose of this study was to employ PALM-COEIN for clinical and histopathological case categorization of AUB while establishing corresponding clinical and pathological relationships.

LITERATURE REVIEW

During past times, the medical field was lacking an accepted classification system for abnormal uterine bleeding (AUB) which led toward unstandardized diagnosis and treatment. In 2011, due to FIGO's need for a method to distinguish between AUB causes with and without a structural basis, the system was introduced by FIGO called the PALM-COEIN system (Munro et al., 2011). The system of categorization is to assist better medical assessment and comparative analysis between patient populations. The introduction of these previous terms menorrhagia, metrorrhagia and dysfunctional uterine bleeding, occurred before the PALM COEIN system (Fraser et al., 2007), and because they enabled the wrong interpretation, their use poor medical care.

Several studies that have been conducted investigated the correlation between PALM-COEIN categorization and the histopathological features found in AUB patients. A Khrouf and Terras (2013) retrospective study mentioned that Leiomyomas were the most common (AUB-L) histological result in women between 35 and 50 years old, except having AUB-L. For proper therapeutic measures, the treatment plan went on to require precise identification of adenomyosis (AUB-A) or endometrial hyperplasia (AUB-M) with histological testing.

Research carried out by Jairajpuri et al. (2013) in which the majority of endometrial biopsies derived from patients who had AUB found proliferative endometrium, ling the connection to ovulatory dysfunctional bleeding (AUB-O). Kotagasti and Jaiswal (2018) reported the main cause of non-structural AUB in addition, they discovered that ovulatory defects that result in irregular and heavy bleeding patterns were the primary cause of non-structural AUB.

Histopathology is the main parameter for AUB pathologies determined by it, but MRI, hysteroscopy and transvaginal ultrasonography help doctors diagnose patients before obtaining histological confirmation. Dueholm et al. (2001) remarked that TVS had enhanced diagnostic accuracy to such an extent that it reduced the requirement of invasive procedures to the minimal extent in the detection of leiomyoma (AUB-L) and endometrial polyp (AUB-P). Bakour et al. (2000) reported a 94% diagnostic accuracy rate when used to diagnose intrauterine diseases and has made wide use of hysteroscopy to be recommended method of evaluation for suspected malignancies and hyperplasia (AUB-M).

Finally, the deployment of the PALM-COEIN system is directly applicable to the treatment strategies via its objective, which is to provide targeted therapies targeted to etiology. Statistical studies demonstrate that success rates of treatment of non-structural causes under medical care are similar to those obtained in surgical procedure such as the treatment of observed structural abnormalities AUB-L or AUB-P (Bahamondes et al. 2015).

According to research findings, Lethaby et al. (2000), an evaluation of the relative effectiveness between LNG-IUS and tranexamic acid as medical treatments for AUB-E and AUB-O revealed that LNG IUS enables better patient life quality, and reduces the volume of menstrual blood discharge for ovulatory dysfunction patients.

Even though the PALM-COEIN classification system is generally accepted, it has several drawbacks when used in common today. The literature discusses mainly that there are difficulties in the classifying of medical cases with multiple characteristics that are identifiable. These two disease conditions are likely to coexist as a pair of diagnosis in leiomyomas (AUB-L) and adenomyosis (AUB-A), a practice we believe requires that clinicians are faced with (Perino et al., 2017). It leaves almost no research as there is a lack of research regarding the "Not Yet Classified" (AUB-N) category, and data we know about unorthodox and newly discovered AUB sources. You're in a restricted medical environment, you have a major challenge acquiring diagnostic tools for medical testing. According to Kotagasti et al. (2020), medical institutions in India have insufficient imaging and histopathology services

resulting in underdiagnosis or nonscientific treatment of AUB patients based on their research.

RESEARCH OBJECTIVE

This study's principal purpose is to classify abnormal uterine bleeding case utilizing PALM COEIN followed by developing correlations between clinicopathological findings. The developmental objectives of this investigation focus on understanding dynamic and fixed causes of AUB alongside diagnostic confirmation capabilities of histopathology and diagnostic method performance evaluation. This study examines diagnostic and treatment failures in cases of AUB, using settings of limited resources and lacks classification in particular in AUB N.

METHODOLOGY

For women aged 15 to 49 years of age, suffering from abnormal uterine bleeding (AUB), the research team carried out a qualitative study. The method of purposive sampling was adopted for the study as it works out exceptionally well to pick up 160 subjects thus giving us inclusive sample within the AUB case type types. Information used included the outcomes of patient interviews and clinical assessment, combined with endometrial biopsy sample histology. PALM-COEIN classification was used by research investigators to divide AUB cases into structural and non-structural causes. Thematic methods were used in the analysis for discovering emerging patterns in histopathological result and clinical presentations as well as treatment outcome. Patient narratives were used to qualitative data analyze the effect of AUB on satisfaction with treatment and healthcare seeking choices and quality of life condition.

RESULTS

Within this research, PALM-COEIN classification technique is used to evaluate 160 AUB cases. In addition to structural and non-structural causes, their histological relationships and patient reported symptoms therapy results and outcome quality of life outcomes are analyzed within the qualitative data.

Table 1

AUB Case Distribution by PALM-COEIN Classification

AUB Category	Number of Cases (n=160)	Percentage (%)
Polyp (AUB-P)	22	13.8%
Adenomyosis (AUB-A)	28	17.5%
Leiomyoma (AUB-L)	35	21.9%
Malignancy/Hyperplasia (AUB-M)	15	9.4%
Coagulopathy (AUB-C)	10	6.3%
Ovulatory Dysfunction (AUB-O)	30	18.8%
Endometrial (AUB-E)	12	7.5%
Iatrogenic (AUB-I)	5	3.1%
Not Classified (AUB-N)	3	1.9%

Figure 1

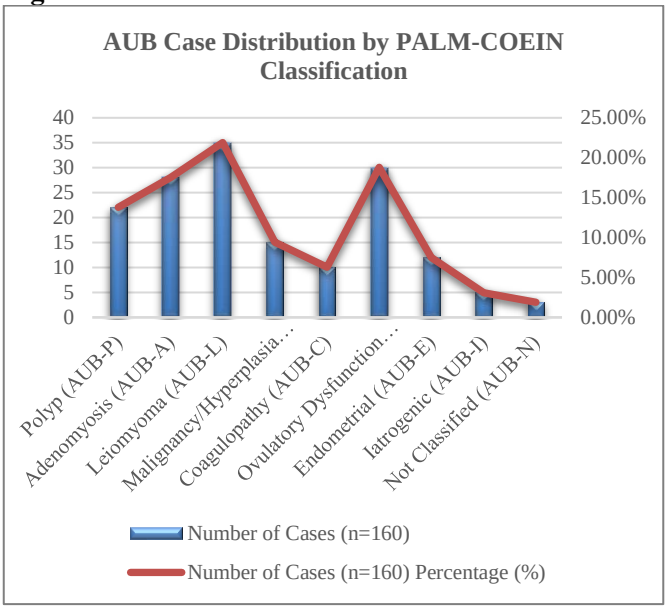


Table 1 summarized that the AUB case distribution using PALM-COEIN classification. For all cases, COEIN accounted for 37.4% and PALM for 62.6%. Of all the non-structural diagnoses, Ovulatory dysfunction (AUB O) was most common, and among the structural AUB L was most common.

Table 2

Distribution of AUB Cases by Age

Age Group (Years)	Number of Cases (n=160)	Percentage (%)
20-30	28	17.5
31-40	65	40.6
41-50	52	32.5
>50	15	9.4

Table 2 showed that the AUB is most among women of age 31 to 40 years old (40.6%), among women of age 41 to 50 (32.5%) and women who are post-menopausal (greater than 50) (9.4%), cases confirmed for hyperplasia and cancer to be the primary factors of the hyperplasia and cancer.

Table 3

Histopathological Results in Cases with AUB

Histopathological Finding	Number of Cases (n=160)	Percentage (%)
Proliferative Endometrium	55	34.4
Secretory Endometrium	32	20
Endometrial Hyperplasia	24	15
Chronic Endometritis	18	11.3
Atrophic Endometrium	12	7.5
Endometrial Carcinoma	9	5.6
Others	10	6.3

Histopathologic result among those cases of AUB revealed proliferative endometrium, with frequency as

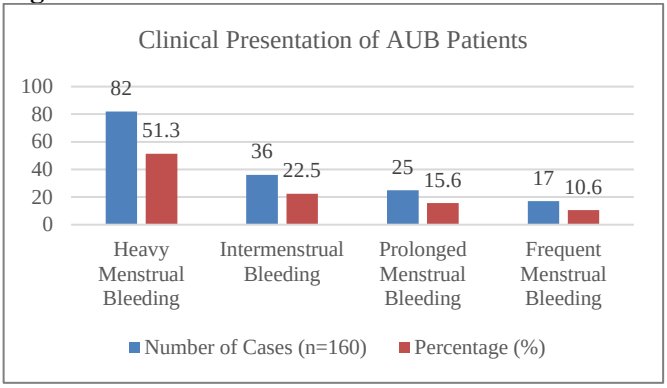
high as 34.4% showing ovulatory dysfunction as a main responsible factor. For postmenopausal patients, screening procedures become essential as 15% cases had endometrial hyperplasia and 5.6 % had endometrial cancer.

Table 4

Clinical Presentation of AUB Patients

Symptom	Number of Cases (n=160)	Percentage (%)
Heavy Menstrual Bleeding	82	51.3
Intermenstrual Bleeding	36	22.5
Prolonged Menstrual Bleeding	25	15.6
Frequent Menstrual Bleeding	17	10.6

Figure 4



AUB patients had heavy menstrual bleeding as the main symptom at the rate of 51.3%, Table 4 showing especially, among those with the diagnosis of leiomyoma and adenomyosis. For most people, bleeding that came between periods was caused by the combination of endometrial polyps and cancer.

Table 5

Patient Response and Treatment Modalities

Treatment Modality	Number of Cases (n=160)	Percentage (%)
Medical Therapy	95	59.4
Endometrial Ablation	20	12.5
Myomectomy/Polypectomy	25	15.6
Hysterectomy	20	12.5

In the majority of cases (59.4%), medical therapy was the initial course of treatment. Myomectomy and polypectomy were the most common surgical procedures used in structural situations; hysterectomy was taken into consideration in more severe cases, especially involving elderly people.

DISCUSSION

AUB can occur in younger women as well as older women who see women with abnormal uterine bleeding as a worrying gynaecological problem. An AUB classification method, PALM-COEIN was used to determine structural and non-structural causes of AUB among 160 patient subjects. The study outcomes provide important patient characteristics information together with the clinical signs of bleeding and their correlations with histological findings and treatment options, and distribution of AUB subtypes.

The findings from the research find fundamental truth about how patients are cared for that agree with earlier scholarly research. It shows that structural factors of PALM categories exceed non-structural factors of COEIN categories, for 62.6% of all AUB cases. The most widely observed structural cause, leiomyoma (AUB-L), was noted at 21.9%. This is in line with other studies showing that leiomyomas are among the most prevalent benign tumours causing AUB, frequently resulting in anaemia and severe monthly bleeding in afflicted women. 17.5% of cases had adenomyosis (AUB-A), which is consistent with other studies' conclusions that adenomyosis is a prevalent cause of menorrhagia and dysmenorrhea, especially in perimenopausal women. 13.8% of cases were caused by endometrial polyps (AUB-P), highlighting their part in intermenstrual haemorrhage. In histological assessment, malignancy and hyperplasia (AUB-M) found 9.4% in endometrial cancer diagnosis respectively in postmenopausal women and the majority of cases. In this study, the AUB-O, which affects ovulatory function, stands as the most causative structural mode at 18.8% of the cases.

This study showed that most of the AUB cases are attributed to hormonal irregularities and mainly in women who are childbearing aged and skipping ovulation periods. In 7.5% of cases, endometrial dysfunction (AUB-E) caused irregular and prolonged menstrual bleeding commony. According to the studies, 6.3% of cases showed evidence of coagulopathy (AUB-C) to suggest that further haematological testing is required to identify bleeding patterns of the affected individuals. The majority of cases of AUB-I are due to hormonal or anticoagulant treatments, and they were attributable to 3.1% of cases with AUB-I. Some AUB cases were hard to assign to some 1.9% (AUB-N) of the AUB complex types, when they could not be declared in a single category. The age bracket with AUB most prominent was among the patients between 31 and 40 making up 40.6% of the population and those in the second highest bracket were 41 and up as 32.5%.

According to previous studies, AUB is a condition most commonly affected among hormonal changes and structural anomalies of the reproductive and aged women. However, the diagnostic assessment is still essential in older adult women (over 50) as 9.4% of women have significant hyperplasia, malignancy and remain undiagnosed.

According to histopathological investigation, the most common finding (34.4%) was proliferative

endometrium, suggesting that ovulatory dysfunction was present in many patients. 20% of cases had secretory endometrium, and 15% had endometrial hyperplasia, which is concerning since it may proceed to cancer. 11.3% of cases had chronic endometritis, indicating that infections may contribute to AUB. 7.5% of cases, mostly in postmenopausal women, had atrophic endometrium, which supports the link between it and oestrogen insufficiency. 5.6% of cases had endometrial cancer, highlighting the need for an early biopsy in suspected instances. HMB was the most common symptom because in 51.3% of cases patients reported HMB.

Results are consistent to other findings from around the world that with regards to gynecological appointments, HMB is the leading factor for why women visit. It was revealed that endometrial polyps and cancers in combinatory amounted to 22.5 % of the cases are indicated in studies that were studied on intermenstrual bleeding. The presence of both the condition of ovulatory dysfunction and coagulopathy led menorrhagia either to pass frequently (10.6%) or persist longer than an average (15.6%).

According to the therapeutic approaches adopted in this study, treatment was personalized for the respective patients. In 59.4% (59.4 percent) cases, medical treatment was considered as the primary form of intervention in every fourth patient. Antifibrinolytics and NSAIDs and hormone therapy were combined to form the basis for this therapy. This demonstrates how well pharmacological treatment works as a first-line strategy for AUB. In 12.5 of cases, the procedure of endometrial ablation was used for patients who did not respond to the medical therapies. Severe cases of women with leiomyomas, polyps or cancers were reserved for hysterekomy (12.5%) and myomectomy/polypectomy (15.6%).

CONCLUSION

Abnormal Uterine Bleeding (AUB) is a major gynecological condition and a woman's life quality is heavily affected. Structural and non-structural AUB causes, their patient population data, clinica1 signs and diagnostic findings and treatment options were examined by using the Palm-COein scheme. Nonstructural causes, including ovulatory dysfunction and adenomyosis, leiomyoma, and endometrial polyps were the primary origins of AUB, although structural causes were predominantly (leiomyomas), secondarily (adenomyosis), or were polyps (endometriosis). It noted that AUB pertained to a substantial number of women aged 31 to 50 years who had sustained the hormonal changes in addition to perimenopause with an impact on its disease development. Since prognosis depends on embryo secretory activity, medical professionals have to give this a priority and heal via histopathological testing because it detects proliferative and secretory endometrium, hyperplasia, and cancer abnormalities. According to the women who experienced the common symptom of heavy menstrual bleeding, the underlying factor was the structure of the body. Restricted and irregular bleeding cycles are due to combination of hormonal misbalance and endometrial defective functioning. According to the study and research, medical care is the most effective therapeutic approach to symptoms, using antifibrinolytics, NSAIDs and hormone therapy to control symptoms. For patients with large (fibroids) or endometrial hyperplasia or malignancy, medical treatments failed and so myomectomy and polypectomy and hysterectomy became two surgical options. These specific treatment options then were based on scientific evaluation procedures of diagnosing and managing AUB with the help of their fundamental source of disease. The PALM COEIN classification system is a useful diagnostic and therapeutic tool amongst the world's healthcare industry as it improves healthcare quality and also contributes to even precise medical diagnosis. There are treatments for AUB that are less invasive, and one field of research would be to study the longer-term impacts on patient outcomes of less invasive treatments for AUB. Treatment selection and appropriate patient education play important role in general health improvement of women with AUB, and prompt action is also essential.

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