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PALM-COEIN Classification in Patients with Abnormal Uterine Bleeding

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Abstract **Original Research Article**

Introduction: Abnormal uterine bleeding, (AUB) is the commonest menstrual problem during reproductive age. However, if the menstrual cycles are too short or too long, and the bleeding amount is too much, or a woman bleeds out of their normal menstrual cycle, that is classified as abnormal uterine bleeding. Abnormal uterine bleeding can have many causes. It is important to identify the type and cause of abnormal uterine bleeding among women to make proper treatment easily accessible and affordable. The FIGO classification system, otherwise known as PALM- COEIN classification system in non-gravid women, is a great method for the determination of types and causes of AUB. ***Aim of the Study:*** The aim of the study was to observe the PALM-COEIN classification among abnormal uterine bleeding cases in Bangladesh. ***Methods:*** This prospective observational study was conducted at the Department of Gynecology, Cumilla Medical College Hospital, Cumilla, Bangladesh. The study duration was 1 year, from July 2021 to June 2022. During this period, a total of 111 cases were selected following the inclusion and exclusion criteria. A purposive sampling method was used for the selection of the patients. ***Result:*** Mean age of the participants was 39.90 years, and the age range was 18-66 years in the present study. Lower abdominal pain was observed in 63.06% of abnormal bleeding cases. The average menstrual cycle length was 15-30 days for 46.85% of participants, and the age at menarche was 11-13 years for 62.16% of participants. 18.02% of the participants had been nulliparous, and 81.99% had been multiparous. Age at marriage was 15 years or lower for 11.71% of the participants, while the majority (54.95%) had been between the ages of 16-20 years. 46.85% had no associated risk factors. 36.04% had obesity, and 21.62% had hypertension. Anemia was a very common clinical finding, observed in 87.39% of cases. USG findings of the patients revealed a bulky uterus for 36.04% of cases, and fibroid was also observed in another 36.04%. Histopathological findings revealed 43.24% had leiomyoma, 19.82% had adenomyosis, and 9.01% had polyps, while PALM-COEIN classification revealed leiomyoma in 38.74% of cases and adenomyosis in 18.02% of cases. ***Conclusion:*** The study observed a higher percentage of women suffering from abnormal uterine bleeding among those aged over 30 years. The majority of the study participants was multipara and was married at an early age. According to FIGO's PALM-COEIN classification system, Leiomyoma and adenomyosis were the most prevalent causes of AUB, which was similar to the histopathological findings.

Keywords: Bleeding, Abnormal, Vaginal, Classification, Leiomyoma, PALM-COEIN.

INTRODUCTION

AUB, or abnormal uterine bleeding, is defined as unusually heavy bleeding and bleeding with irregular timing [1]. It is an umbrella term that includes heavy menstrual bleeding, intermenstrual bleeding, and ovulatory disorders, and it has replaced previously used inconsistencies and ambiguities such as menorrhagia, metrorrhagia, and dysfunctional uterine bleeding [2]. It is a prevalent medical issue that affects around one-third of all females at some point in their life [3, 4]. The International Federation of Gynecology and Obstetrics (FIGO) defines acute AUB as "an episode of bleeding in a woman of reproductive age who is not pregnant that is of sufficient magnitude to require rapid management to prevent further blood loss." Furthermore, chronic AUB is described as "uterine corpus bleeding that has been present for the majority of the last 6 months and is abnormal in duration, volume, or frequency" [5]. AUB is diagnosed both inpatient and outpatient settings and accounts for up to 70% of gynecological visits [6]. The International Federation of Gynecology and Obstetrics (FIGO) created a repeatable AUB classification system in 2011 [2]. Polyp; adenomyosis; leiomyoma; malignancy and hyperplasia; coagulopathy; ovulatory dysfunction;

endometrial; iatrogenic; and not yet identified are popular terms for this spectrum's nomenclature (PALM-COEIN). The etiologies are endometrial/uterine polyp (P), adenomyosis (A), leiomyoma (L), malignant uterine body lesions (M), and non-structural disorders such as coagulopathies (C), ovulatory dysfunction (O), endometrial dysfunction (E), iatrogenic (I), and not yet defined (N) [2]. AUB can result in severe anemia and other medical issues, lowering patients' quality of life. There are several medicinal and surgical treatments available, each customized to the acuity and severity of the AUB. Hormonal medicines, endometrial ablation, hysteroscopic surgery, hysterectomy, and uterine artery embolization are some of the most often utilized therapeutic alternatives. Hysterectomy is the final treatment for AUB; however, less invasive alternatives such as medicinal therapy and endometrial ablation are also possible [2, 7]. Furthermore, when planning hormone therapy, it is necessary to screen out precancerous diseases such as hyperplasia or subclinical endometrial carcinoma [8]. The PALM- COEIN method, when used correctly, can aid in the systematic classification of women with AUB, which can help physicians and researchers provide trustworthy information for research such as epidemiological and prevalence studies, as well as appropriate diagnosis and treatment. This method also facilitates in the selection of appropriate treatment for women with varying menstrual bleeding patterns [9]. Histological investigation, which confirms the diagnosis and directs the proper therapeutic plan, is the cornerstone of modern practice in AUB patients.

OBJECTIVE

General Objective

- To observe the PALM-COEIN classification among abnormal uterine bleeding cases in Bangladesh.
- To observe the age distribution of abnormal uterine bleeding cases among the Bangladeshi population.

METHODS

This prospective observational study was conducted at the Department of Gynecology, Cumilla Medical College Hospital, Cumilla, Bangladesh. The study duration was 1 year, from July 2021 to June 2022. During this period, a total of 111 cases were selected following the inclusion and exclusion criteria. A purposive sampling method was used for the selection of the patients. Patient information was collected based on a pre-made questionnaire that included clinical and sociological variables. Informed written consent was obtained from each participant prior to data collection, and ethical approval regarding the study was also obtained from the ethical review committee of the study hospital. Collected data were analyzed using SPSS version 26 software, and presented in tabular and graphical format. The FIGO classification system for diagnosing abnormal uterine bleeding was used in the present study. The core classification system was designed to facilitate the development of subclassification systems, as necessary. The basic system comprises 4 categories that are defined by visually objective structural criteria (PALM: polyp; adenomyosis; leiomyoma; and malignancy and hyperplasia), 4 that are unrelated to structural anomalies (COEI: coagulopathy; ovulatory dysfunction; endometrial; iatrogenic), and 1 reserved for entities that are not yet classified (N).[2] The AUB cases were further characterized according to the FIGO PALM-COEIN classification. The diagnosis was based on the patient's history, physical examination, ultrasonogram, hysteroscopy, dilatation and curettage, endometrial biopsy, and serum analyses.

Table 1: PALM COEIN Explanation

PALM COEIN	Abbreviation
P	Polyp
A	Adenomyosis
L	Leiomyoma
M	Malignancy
C	Coagulopathy
O	Ovulatory Dysfunction
E	Endometrial
I	Iatrogenic
N	Not Yet Classified

Inclusion Criteria

- Patients with present abnormal uterine bleeding.
- Patients with a history of abnormal uterine bleeding.
- Patients of both reproductive and non-reproductive age.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Mentally ill.
- Unable to answer the criteria question.
- Exclude those affected with other chronic diseases etc.

RESULTS

Table 2: Age distribution of the cases (n=111)

Age Groups	n	%
≤20	3	2.70%
21-30	13	11.71%
31-40	48	43.24%
41-50	40	36.04%
51-60	4	3.60%
>60	3	2.70%
Mean ± SD	39.90 ± 9.112	
Minimum-Maximum	18-66	

Among the participants, a majority (43.24%) had been from the age group of 31-40 years, while 36.04% had been from the age group of 41-50 years.

The mean age of the participants was 39.90 years, and 2.70% had 20 years or younger, while another 2.70% had been over 60 years of age. The minimum age in the present study was 18 years, and the maximum age was 66 years.

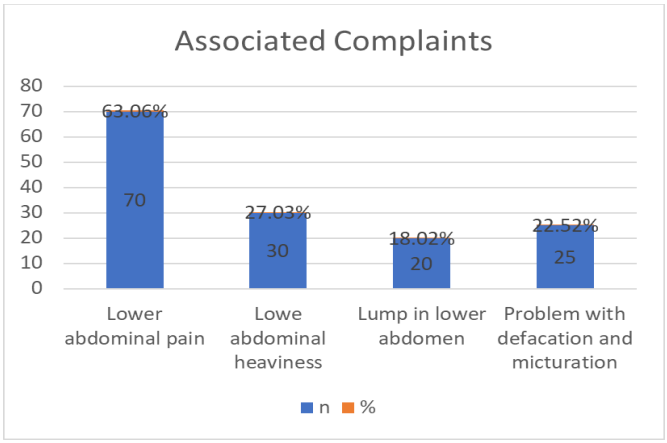

Figure 1: Distribution of cases by associated complaints (n=111)

Alongside abnormal uterine bleeding, 63.06% had lower abdominal pain, 27.03% had lower abdominal heaviness, 18.02% had a lump in the lower abdomen, and 22.52% had a problem with defecation and micturition.

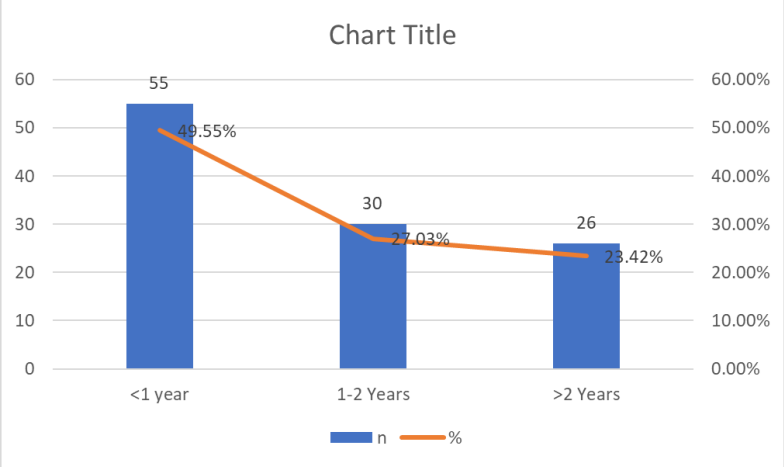

Figure 2: Distribution of cases by the duration of AUB (n=111)

For the duration of AUB, 49.55% had AUB for <1 year, 27.03% had AUB for 1-2 years, and 23.42% had AUB for over 2 years. The duration of AUB among participants ranged from 6 months to 5 years.

Table 3: Distribution of cases by menstrual history

Menstrual History	n	%
Average Cycle length		
<15 days	32	28.83%
15-30 days	52	46.85%
>30 days	5	4.50%
Irregular	22	19.82%
Age at menarche		
≤10 years	17	15.32%
11-13	69	62.16%
14-16	25	22.52%

Among the participants, 48.45% had an average cycle length of 15-30 days, 28.83% had an average cycle length of <15 days, and 4.50% had an average cycle length of above 30 days. The remaining 19.82% had highly irregular menstrual cycles. Age at menarche was 10 years or lower for 15.32% of the participants, while 62.16% had an age of menarche between 11-13 years, while the remaining 22.52% had menarche at the ages of 14-16.

Table 4: Distribution of cases by Obstetrical history

Obstetrical History	n	%
Parity		
0	20	18.02%
1-2	50	45.05%
≥3	41	36.94%
Age at Marriage		
≤15	13	11.71%
16-20	61	54.95%
21-25	21	18.92%
>25	2	1.80%
Minimum-Maximum	14-35	
Mean ± SD	18.94±3.35	

18.02% had been nulliparous, 45.05% had 1-2 parity, and 36.94% had 3 or higher parity. Age at marriage was 15 years or lower for 11.71% of the participants, while the majority (54.95%) had been between the ages of 16-20 years. 18.92% had been married between the ages of 21-25 years, while 2 patients had been married after 25 years of age. The mean age at marriage was 18.94 years, and the minimum was 14 years while the maximum was 35 years.

Table 5: Distribution of the cases by associated risk factors (n=111)

Associated Risk Factors	n	%
No Associated Risk Factors	52	46.85%
Obesity	40	36.04%
Hypertension	24	21.62%
Thyroid Disorder	14	12.61%
Diabetes	14	12.61%
History of PCOS	2	1.80%
Family H/O Endometrial Carcinoma	1	0.90%

46.85% had no associated risk factors. 36.04% had obesity, 21.62% had hypertension, 12.61% had thyroid disorders, and diabetes was also present in 12.61% of participants. 1.80% had a history of polycystic ovarian syndrome, and 1 had a family history of endometrial carcinoma.

Table 6: Distribution of the cases by clinical findings

Clinical Findings	n	%
Anemia	97	87.39%
High Blood pressure	30	27.03%
Edema	5	4.50%
Fever	4	3.60%

87.39% had anemia, 27.03% had high blood pressure, 3.60% had a fever, and 4.50% had edema.

Table 7: Distribution of the cases by per abdominal findings

Per Abdominal Findings	n	%
Inspection		
Distended	10	9.01%
LSCS Scar	11	9.91%
No Abnormality Detected	90	81.08%
Palpation		

Presence of Large Mass	24	21.62%
Soft, Non-Tender	20	18.02%
No Abnormality Detected	67	60.36%
Percussion		
No Abnormality Detected	111	100.00%
Auscultation		
No Abnormality Detected	111	100.00%

Per-abdominal findings of the participants revealed that during the inspection phase, no abnormality was detected in 81.08% of participants, while an LSCS scar was observed in 9.91% of patients and 9.01% had distended abdomen. during the palpation Phase, 21.62% had the presence of a large mass, 18.02% had soft and non-tender palpation, and 60.36% had no abnormality. No abnormality was found in any patients during percussion or auscultation

Table 8: Distribution of the cases by per vaginal findings

Per Vaginal Findings	n	%
Inspection		
Vaginal Bleeding	40	36.04%
History of Vaginal Bleeding	60	54.05%
No Abnormality Detected	11	9.91%
Per Speculum Finding		
Bleeding	38	34.23%
Broad Cervix	8	7.21%
Presence of Polyps	6	5.41%
No Abnormality Detected	59	53.15%

36.04% had vaginal bleeding, and 54.05% had a history of vaginal bleeding during per vaginal inspection. Per speculum, findings revealed bleeding in 34.23% of cases, broad cervix in 7.21% of cases, and the presence of a polyp in 5.41% of cases.

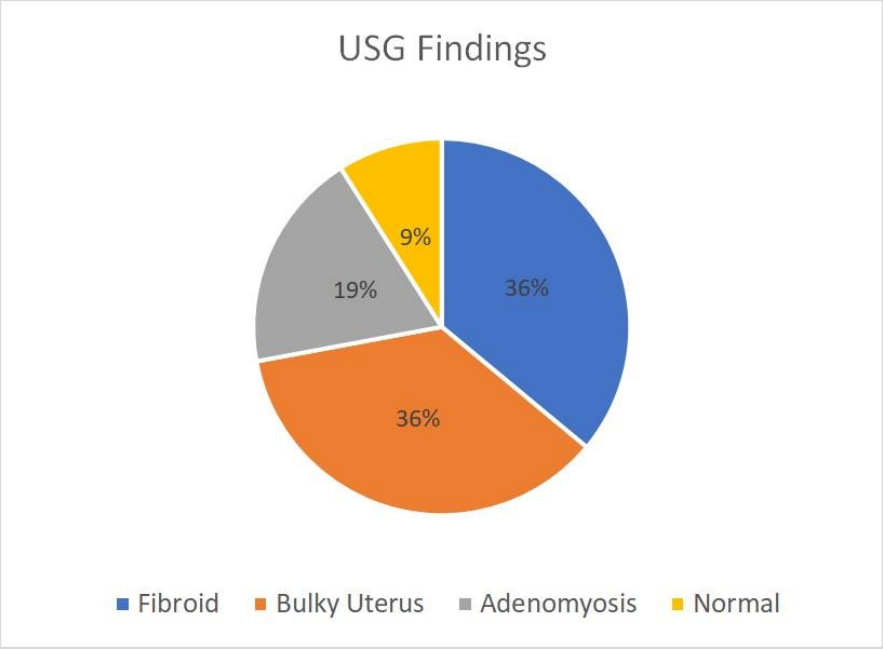

Figure 3: Distribution of cases by ultrasonography findings

USG findings of the patients revealed fibroid for 36.04% of cases, bulky uterus for another 36.04% of cases, adenomyosis for 18.92%, and normal findings for 9.01% of cases.

Table 9: Distribution of the cases by histopathological findings

Histopathological Findings	n	%
Adenomyosis	22	19.82%
Endometrial Hyperplasia	14	12.61%
Leiomyoma	48	43.24%
Malignant Ovarian Tumor	2	1.80%
Polyps	10	9.01%
Others	8	7.21%
No Abnormalities	7	6.31%

Histopathological findings revealed that 43.24% had leiomyoma, 9.01% had polyps, 19.82% had adenomyosis, 12.61% had endometrial hyperplasia, 1.80% had a malignant ovarian tumor, while 6.31% had no abnormalities.

Table 10: Distribution of the cases by PALM-COEIN Classification

PALM-COEIN Findings	n	%
Polyp	8	7.21%
Adenomyosis	20	18.02%
Leiomyoma	43	38.74%
Malignancy	2	1.80%
Coagulopathy	0	0.00%
Ovulatory Dysfunction	17	15.32%
Endometrial	8	7.21%
Iatrogenic	0	0.00%
Not Classified	13	11.71%

According to PALM-COEIN classifications, 38.74% had leiomyoma, 18.02% had adenomyosis, 15.32% had ovulatory dysfunction, 1.80% had malignancy, 7.21% had polyps, 11.71% were unclassified.

DISCUSSION

AUB (abnormal uterine bleeding) is a common and chronic condition that affects women during their reproductive years. The varied use of terminology to describe AUB symptoms has caused problems in a variety of areas, including symptom documentation, determining the best medical and surgical treatments, designing and interpreting research data, and attempting to conduct multinational clinical trials. These concerns were addressed by the International Federation of Gynecology and Obstetrics (FIGO) Menstrual Disorders Working Group, which later became a standing committee, the Menstrual Disorders Committee. The FIGO PALM-COEIN classification system aids in the understanding of potential AUB etiology and allows for the characterization of the cause through the use of universal terminology to describe menstrual disorders [10-12] The present study was conducted with a total of 111 cases of abnormal uterine bleeding to observe the prevalence of different types of bleeding according to the PALM-COEIN classification system. Among the study participants, the minimum age of the participants was 18 years, and the maximum was 66 years, with the mean age being 39.90 years. The majority of the participants (43.24%) had been from the age group of 31-40 years. This age distribution was similar to another study regarding dysfunctional uterine bleeding, where a majority had been between the ages of 30-39 years [13]. However, a slightly higher mean age was also observed in another study, where a majority had been from the age group of 41-50 years [14]. Alongside AUB, lower abdominal pain was also a major complaint for almost 63% of the participants, while 27.03% had lower abdominal heaviness. This was contradictory to the findings of multiple other studies, where patients with abnormal uterine bleeding had abnormal pain in very low incidence [15, 16]. About half the present study participants had AUB for less than 1 year, while 27.03% had bleeding for 1-2 years, and the remaining 23.42% had AUB for longer durations. The duration of AUB ranged from as short as 6 months to as long as 5 years among the present study participants. This longer duration of AUB before visiting the hospital to seek help might be influenced by the financial state of the participants, as well as the overall structure of our society. According to the collected records of patients, the average cycle length was less than 15 days for 28.83% of participants, while 46.85% had a cycle length of 15-30 days. 19.82% had irregular menstrual cycles. In adolescents, the normal age of menarche is 12-13 years, and the normal menstrual cycle length is 21-45 days [17-20]. As observed, the majority of the present study participants had an average cycle length of 15-30 days, which was similar to the general standard. The age of menarche was also similar to the general standard in a majority of participants, while 15.32% had menarche before the age of 11. According to obstetrical history, it was found that

18.02% had been nullipara, while the remaining had been multipara. This high number of nullipara women was contradictory to the findings of another study, where less than 5% of participants were nullipara [21]. This high incidence of nullipara women among the present study participants might be an indication of some other primary cause, subfertility, or infertility among the population of Bangladesh. Age of marriage might also have been a factor in this, as a large number of participants had been married before the age of 21. 11.71% of the participant had been married before the age of 16, and some had been married as early as 14 years of age. Studies have shown early marriage to have some significant impact on the parity and gravida of women [22]. Marrying at too early of an age can cause damage to the sexual organs of women, and can lead to childlessness [23]. No major associated risk factors were present in the majority (46.85%) of the participants, but some patients had multiple risk factors present. 36.04% had Obesity, 21.62 had hypertension, 12.61% had diabetes, and thyroid disorder. Obesity has been proven to have a relation to the prevalence of metabolic syndrome, which can cause malignancy and abnormal bleeding among patients [3]. Hypertension and obesity are not uncommon among the older population of Bangladesh, both males and females have a higher incidence of obesity, hypertension, and diabetes among the Bangladeshi population. Anemia was the most common clinical finding among the participants, observed in 87.39% of the study population. 27.03% of patients had high blood pressure. Anemia is a common finding in almost all studies regarding abnormal uterine bleeding [24-26]. During the inspection portion of per-abdominal findings, the majority had no abnormality. During the palpation portion, it was observed that 21.62% had the presence of a large mass, while another 18.02% had soft and non-tender palpation, and 60.36% had no abnormalities. Percussion and auscultation did not find any abnormalities among any of the patients. During per vaginal examination, vaginal bleeding was detected in 36.04% and a history of vaginal bleeding in 54.05% during the inspection portion, while per speculum findings revealed bleeding in 34.23%, broad cervix in 7.21%, and presence of polyps in 5.41% of cases. Ultrasonography of the patients revealed a bulky uterus in 36.04% of cases, while another 36.04% had fibroid, 18.92% had adenomyosis, and 9.01% had normal findings. Histopathological findings of the patients showed leiomyoma in 43.24% of cases, adenomyosis in 19.82% of cases, and polyps in 29.01% of cases. According to the PALM-COEIN classification system, adenomyoma, leiomyoma, and polyps had similar incidence rates as compared to histopathological findings, and malignancy was similar in both findings. Ovulatory dysfunction (O) was observed in 15.32% of the cases, while endometrial polyps (E) were observed in 7.21% of cases.

Limitations of the Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

The study observed a higher percentage of women suffering from abnormal uterine bleeding among those aged over 30 years. The majority of the study participants was multipara and was married at an early age. According to FIGO's PALM-COEIN classification system, Leiomyoma and adenomyosis were the most prevalent causes of AUB, which was similar to the histopathological findings.

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Conflict of Interest: None declared.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

RECOMMENDATION

The study was conducted with very few participants and a short duration, and as such association or correlation between histopathological findings and the FIGO classification system could not be measured. Further study with a larger sample size and a more focused questionnaire can help in observing the correlation between histopathological and FIGO classification of causes behind abnormal uterine bleeding.

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