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Study of adolescent abnormal uterine bleeding (AUB) and it's outcome- in tertiary centre

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Abstract
Objectives: To classify adolescent abnormal uterine bleeding (AUB) according to PALM COIEN classification and its outcome in tertiary care centre.
Material and Methods: This study is observational study, conducted in J K Lone Mother and child hospital, Medical College Kota, from June 2019 to June 2020. Out of all the girls attending OPD, adolescents with non-menstrual complaints, primary amenorrhea and dysmenorrhea were excluded. Finally girls with complaints of heavy period, irregular cycles and oligomenorrhoea (AUB) formed the study group. Complete blood count, PT/aPTT, kidney function test, liver function test and random blood sugar and Thyroid Function Test (TFT) were done in all girls. If PT/aPTT was dear ranged then further coagulation profile was done. Trans abdominal ultrasonography (USG) was done and MRI and CT were also done as per needed. In suspected PCOS cases and girls with obesity, oligomenorrhoea and hirsuitism additional tests like Follicle Stimulating Hormone (FSH), Leutinizing Hormone (LH), Serum Prolactin level, Free Testosterone and insulin level done. The Prevalence of menstrual disorder in adolescent was calculated. Management of cases according to FIGO guideline was done. Treatment of AUB would be based on underlying etiologic and severity of bleeding. Evaluation of menstrual blood loss was assessed using The pictorial blood assessment chart (PBLAC) [1-3]
Results: The mean age of patients was 15.08 years with majority (47.5%) having age between 13-15 years followed by 40% in age group 16-19 years and 12.5% in age group 10-12 years. Here, 90% patients were inn AUB-O class followed by 4.5% in AUB-N, 2.5% in AUB-C, 2% in AUB-I, 0.5% in AUB-L and AUB-P class. According to palm 1% and coein 99%.Out of 180 patients which were in AUB-O class according to Palm Coein classification, 47.2% had immaturity of hypothalamic pituitary ovarian axis followed by 39.4% had PCOS and 13.3% had thyroid disorder.
Conclusion: The study concluded that Menorrhagia in adolescents can be caused by a number of condition, the most common being the immature hypothalamic-pituitary-ovarian axis. Assessment of each case with through history, physical examination, and laboratory in investigation is crucia in reaching the diagnosis. We see that we can successfully apply palm coein approach to adolescent AUB. Although bulk of adolescent. AUB is due to ovulatory disorder. We can conclude from the present study that commonest cause of puberty menorrhagia is immaturity of the hypothalamic- pituitary ovarian axis resulting in anovulation. Anatomical abnormalities like fibroid or polyp are also to be ruled out. Once the diagnosis is made medical or surgical treatment as appropriate is to be administered. Early innervation as soon as students are admitted into higher school of learning would be beneficial in helping them to manage this unavoidable experience without any effect on their health and academic work.

Keywords: Adolescent abnormal, AUB, gynaecologic, bleeding occurring

Introduction
World health organization (WHO) defines adolescence as the age between 10 and 19 years and is a transitional stage between child and adulthood. AUB is defined as bleeding from uterine origin that is abnormal in duration, volume, frequency and regularity. It accounts for half of the gynaecological problems among adolescents. Excessive bleeding in amount (>80ml) or in duration (>8 days) between menarche and 19 years of age and is a form of AUB. The transition from anovulatory to ovulatory cycle during adolescence takes place during the first several years after menarche [1].
Cycles that are longer than 42 days, bleeding that occurs more frequently than 21 days, and bleeding that last more than 8 days should be considered abnormal, particularly after the first 2 years from the onset of menarche. Bleeding occurring less frequently than an interval of 90 days is abnormal, even in the first gynaecologic year after menarche [2].

An improved classification system for abnormal uterine bleeding has been named by International Federation of Gynaecology and Obstetrics (FIGO) in 2011, which is called PALM-COEIN. PALM holds for the pathologies related to the uterine structural anomalies (polyp, adenomyosis, leiomyoma, malignancy and endometrial hyperplasia). COEIN holds for the pathologies unrelated with uterine structural anomalies (ovulatory dysfunction, coagulopathy, endometrial, iatrogenic, and unclassified) [3]. PALM side of the classification refers to structural causes that may be evaluated by imaging techniques and/or histopathology and the COEIN side by investigating the underlying medical disturbances. The most common cause of AUB in the adolescent is anovulation. Anovulation can result from abnormalities at any levels of the hypothalamic-pituitary-ovarian (HPO) axis resulting in the interruption of ovulation[4]. The second most common cause of AUB in adolescents is coagulopathy. Platelet dysfunction has been noted to be the most common haemostatic defect found in adolescents with AUB. The first-line approach to acute bleeding in the adolescent is medical management; surgery should be reserved for those who do not respond to medical therapy. Primary goals are prevention of complications, such as anemia and reestablishment of regular cyclical bleeding [5].

AUB is very rarely due to structural problems (1.3-1.7%) in adolescents. Anovulatory cycles, discussed separately below, which may manifest as amenorrhea, oligomenorrhea or HMB owing to immature hypothalamic-pituitary-ovarian axis are the most common cause of AUB among adolescents. As another leading etiology, coagulopathy prevalence is reported to vary between 5% and 28% among hospitalized adolescents with HMB in different studies. In a systematic review gathering data of 988 women (15-55 years) with HMB, the incidence of von Willebrand disease (vWD) was found to be 13%. Coagulopathy may also be due to other coagulation factor deficiencies, immune thrombocytopenia, platelet dysfunction, thrombocytopenia secondary to malignancy or due to treatments for malignancy. Coagulopathy may be an isolated or accompanying disorder [6]. Thyroid dysfuction may be a cause. Etc

The choice of treatment for acute management is dependent on clinical stability, overall acuity, suspected etiology of the bleeding, and underlying medical problems. AUB is very rarely due to structural problems (1.3-1.7%) in adolescents.

Study Design

This study is prospective, observational and hospital based study. The study was conducted in j k lon mother and child hospital medical college kota.

Study Population

The study population included young girls (10-19 years of age) attending gynaecology OPD at J. K. LONE Hospital GMC Kota June 2019 to June 2020. All adolescents are subjected to detailed and confidential evaluation.

Inclusion Criteria

1. All OPD patients attending gynae clinics present with AUB.
2. Age group 10-19 years

Exclusion Criteria

Exclusion criteria comprised of

1. Pregnancy,
2. Below 10 year and above 19 year girls,
3. Non menstrual complaints like Primary amenorrhoea, dysmenorrhoea
4. Genitals injuries

Sampling Technique: girls in age group of 11-19 years who attended OPD with subjective symptoms of excessive MBL were enrolled in the study. informed consent was taken. The cases fulfilling the inclusion criteria was taken for study. The study population was evaluated by detailed history and ex amination and predesigned proforma was filled for each patient.

Procedure of study: History (history was taken from parents/guardian (whenever required in addition to patients) History should be taken from both with and without the parents. History included; menstrual history (age of menarche, regularity, duration, number of pads\tampons per day), sexual history, past medical history (systemic illness, current\recent medication), systemic review (symptoms associated with systemic causes of HMB such as obesity, PCOS, hypothyroidism, hyperprolactinemia, hypothalamic or adrenal disorder) and family history (coagulopathy, hormone sensitive cancers). History of heavy menses since menarche, surgery related bleeding, bleeding associated with dental work, bruising or epistaxis one to two times per month, frequent gum bleeding and bleeding symptoms in family point an underlying bleeding disorder. Then a thorough clinical examination was performed which included; general survey, systemic and gynaecological examination. (whenever applicable). Detailed general physical and systemic examination was done after informed verbal consent from the patient and her accompanying guardian. Finally girls with complaints of heavy period, irregular cycles and oligomenorrhoea (AUB) formed the study group.

Complete blood count, PT/aPTT, kidney function test, liver function test and random blood sugar and Thyroid Function Test (TFT) were done in all girls. If PT/aPTT was deranged then further coagulation profile was done. Trans abdominal ultrasonography (USG) was done in MRI and CT were also done whenever needed. In suspected PCOS cases and girls with obesity, oligomenorrhoea and hirsuitism additional tests like Follicle Stimulating Hormone (FSH), Leutinizing Hormone (LH), Serum Prolactin level, Free Testosterone and insulin

Prevalence of menstrual disorder in adolescent was calculated management and of cases according to FIGO guideline was done.

Treatment of AUB would be based on underlying etiologic and severity of bleeding.

Evaluation of menstrual blood loss was assessed using the pictorial blood assessment chart (PBLAC). Following results were obtained

Table 1: Distribution of patients according to duration of menstrual flow

Duration Of Menstrual Flow	No. of Patients	Percentage
<3	81	40.5
3-5	42	21
>5	77	38.5
Total	200	100

Table 2: Distribution according to complaints

Chief Complaints	No. of Patients	%
Absent Menstrual Bleeding(amenorrhea)	24	12
Painful menstruation	7	3.5
Heavy Menstrual Bleeding	90	45
Irregular Menstrual Bleeding(oligomenorrhea)	40	20
Pain Abdomen	25	12.5
Vaginal Discharge	14	7
Total	200	100

Table 3: Distribution of patients according Pattern of bleeding (according to FIGO guideline)

Pattern of bleeding		No. of Patients	%
Infrequent (one or two episode in a 90 days periods)	Heavy	85	42.5
	Light	22	11
Frequent (more than four episodes in a 90 days periods)	Heavy	6	3
	Light	33	16.5
Irregular(variation >20 days over a periods of one year)	mild	10	5
	moderate	34	22
	severe	10	5
Intermenstrual bleeding		12	6
Total		200	100

Table 4: Distribution according to altered coagulation

Family History	No. of Patients	%
Bleeding Disorder In Family	1	0.5
Coagulopathy due to thrombocytopenia dengue fever	1	0.5
Coagulopathy due to malaria	1	0.5
Coagulopathy due to ITP	1	0.5
NAD	196	98
Total	200	100

Table 5: Distribution according to Hemoglobin

Hemoglobin	No. of Patients	%
>11.4	5	2.5
10-11.4 (Mild Anaemia)	44	22
7-9.9 (Moderate Anaemia)	135	67.5
<7 (Severe Anaemia)	16	8
Total	200	100
Mean±SD	8.7±1.25	

Table 6: Distribution according to USG findings

USG	No. of Patients	%
Bulky Ovary And PCOD	71	35.5
Isolated Single Ovary Cyst	29	14.5
Leiomyoma	2	1
Normal USG	93	41.5
Polyp	1	0.5
PID(Endometritis)	4	2
Total	200	100

Table 7: Distribution according to PALM COEIN classification

Palm Coein	No. of Patients	%
AUB -P	1	0.5
AUB-A	0	0
AUB -L	1	0.5
AUB-M-	0	0
AUB-C	5	2.5
AUB-O	180	90
AUB -E	4	2
AUB-I	0	0
AUB- N	9	4.5

Here, 90% patients were inn AU-O class followed by 4.5% in AUB-N, 2.5% in AUB-C, 2% in AUB-I, 0.5% in AUB-L and AUB-P class. According to palm1% and coein 99%.

Discussion

AUB is a common disorder in adolescent which leads to significant complication. It is one of the common causes of hospitalization in adolescent females.

Menarche is a hallmark event in the life of adolescent girls it marks the transition from childhood to puberty. Most common presentation of abnormal uterine bleeding in adolescents is puberty menorrhagia. It is defined as excessive bleeding occurring between menarche and 19 years of age.

Our study: showed mean age of patients15.08 years. Our results consistent with Singh *et al*. we found mean age at which menarche start was 12.07 years with majority (75.5%) had start of mensuration at 13-15 years followed by 33.5% had start age of mensuration at 10-12 years and in only 1% patients mensuration start between 16-19 years. Comparable to our results Sri and Jehon.

Distribution of patients according to duration of menstrual flow and we found that 40.5% patients had menstrual flow less than 3 days followed by 38.5% had flow greater than 5 days and 21% had flow between 3-5 days. In consistent with this Chauhan *et al* [7]. Distribution according to complaints and we found that majority (45%) had heavy menstrual bleeding follow ed by 12.5% had pain abdomen, 12% had amenorrhea, 7% had vaginal discharge and 3.5% had dysmenorrhoea. In consistent with our results Singh *et al* [1]. Table: 3 shows the bleeding pattern and we found that 42.5% had infrequent heavy bleeding and 11% had infrequent light bleeding. In 3% had frequent heavy bleeding and 16.5% had frequent light bleeding. In 5% had irregular mild bleeding and 22% had irregular moderate bleeding and 5% had severe irregular bleeding. Only 6% had Intermenstrual Bleeding. majority of girls have anovulatory menstruation during start of puberty. This results in abnormal pattern of bleeding for irregular duration. This problem range from spotting to profuse bleeding. Our results are comparable with Singh *et al*. [1] found that Majority of cases presented with heavy menstrual bleeding (68.95%). They also found that 6.89% had intermenstrual bleeding. Menstrual patterns were irregular in 39.65% cases. Cycle were frequent in 20.68% cases & infrequent cycle were present in 32.75% cases. Gautam *et al* [8].

Shows distribution according to hemoglobin and we found that majority of patients were anemic with 67.5% had moderate anemia followed by 19% had mild anemia, 8% had severe anemia and 5.5% had normal hemoglobin. Comparable to our results Singh *et al*. [1] also found that all of subject were anemic mild anaemia was present in 70.68%and 22.40%was moderately anaemic and 6.89% was severely anaemic. Mandal *et al*. [9] observed that 67% of the patients had menorrhagia for 6 months to 1 year and 63.5% of all patients had hasemoglobin level 10 gm % or less. Most of the cases of AUB in adolescent age group with severe anemia represent late because of inability to access amount of blood lossleading to severe anemia and later admission.

We found mean age at which menarche starts was 12.07 years with majority[75.5%] had starts of menstruation at 13 to 15 years followed by 33.5% had sa distribution of patients according to duration of menstrual flow and we found that 40.5% patients had menstrual flow less than 3 days followed by 38.5% had flow greater than 5 days and 21% had flow between 3-5 days.

Our study shows distribution according to complaints and we found that majority (45%) had heavy menstrual bleeding followed by 12.5% had pain abdomen, 12% had amenorrhea, 7% had vaginal discharge and 3.5% had dysmenorrhoea.

Our study findings are consistent with this Mandal *et al*. [9] where anovulatory dysfunctional uterine bleeding (DUB) and polycystic ovarian disease (PCOD) were the two main etiological factors for puberty menorrhagia in their study responsible for 72% and 10.5% of the cases respectively. Six patients (3.0%) had idiopathic thrombocytopenic purpura (ITP) and 8.5% of the patients were hypothyroid. Genital tuberculosis

was detected in 5 cases (2.5%) and one patient was diagnosed to have - von Willebrand disease. Singh *et al.* [1] found that anovulatory causes were most common in 80.98% cases, structural causes were present in 5.16% cases and coagulopathies were present in 3.44% cases of AUB. Laddad *et al.* [10]. Our study findings are comparable to ladded *et al.* we observed in this study this 55-82% of adolescent had an ovulation post menarche due to HPO axis immaturity,

In our study treatment included 58% are given tranexamic acid followed by oral progestins (48%), oral progestins and tranexamic acid (47%), 45% were given OCP. 9.5% girls received blood and blood products and 12% received levothyroxine.

Conclusion

Abnormal menstrual bleeding in adolescents can be caused by a number of conditions. Once a proper diagnosis is made counseling, reassurance and follow up are required. The study concluded that Menorrhagia in adolescents can be caused by a number of condition, the most common being the immature hypothalamic-pituitary-ovarian axis. Assessment of each case with thorough history, physical examination, and laboratory investigation is crucial in reaching the diagnosis. We see that we can successfully apply palm coein approach to adolescent AUB. Anatomical abnormalities like fibroid or polyp are also to be ruled out. Once the diagnosis is made medical or surgical treatment as appropriate is to be administered. Early intervention as soon as students are admitted into higher school of learning would be beneficial in helping them to manage this unavoidable experience without any effect on their health and academic work.

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