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Review Article

Abnormal Uterine Bleeding among Adolescents: A Neglected Problem

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Abstract

Onset of menstruation is an important indicator of puberty among girls. A large number of adolescents suffer from abnormal uterine bleeding (AUB) during the initial months after the onset of menarche. Although menstrual problems seen among most of the adolescents are physiological, however, a large proportion of adolescents suffer from pathological AUB. The knowledge of magnitude and causes of abnormal uterine bleeding among adolescents, pathological as well as physiological, is important to plan strategies for management of this problem. Review of literature was done manually as well as electronically through PubMed, Google Scholar, Cochrane library, IndMed, Embase and WHO databases. Relevant studies conducted in India as well as other countries were searched. The most common cause (72-80%) of AUB among adolescents is anovulatory cycles due to immature hypothalamic-pituitary-ovarian axis. Other causes include bleeding disorders, thyroid disorders, and Polycystic Ovarian Disease. AUB is an important health concern among the adolescents. There is a need to create awareness regarding the physiological and pathological causes of menstrual problems among adolescents. The health care providers also need to be trained for identification and management of this problem.

Keywords: Adolescence, Abnormal uterine bleeding, Menorrhagia, Puberty

Introduction

Puberty is defined as a state of being capable to reproduce sexually. It is generally denoted by production of sex hormones, maturing of reproductive organs and start of menstruation in females.[1] Most common physical features associated with puberty in girls are breast enlargement, pubic and axillary hair growth, increase height and onset of menstruation. Various factors that influence menstruation may be genetics, nutritional or body weight. Most important factor affecting menstruation is the maturation of hypothalamic pituitary ovarian axis.[2]

Majority of girls have anovulatory menstruation during start of puberty.[3] This can result in abnormal pattern of bleeding for irregular duration. The problems can range from spotting to profuse bleeding. Menstrual problems like amenorrhea, oligomenorrhoea, irregular cycles, abnormal uterine bleeding and dysmenorrhea form about 50% of the gynecological problems faced by adolescent and young females.[4] All these problems are included under the term abnormal uterine bleeding (AUB) of adolescents. Puberty menorrhagia is a major cause of abnormal uterine bleeding of adolescent and is defined as excessive bleeding occurring between menarche and 19 years of age.[5] A large proportion of cases of puberty menorrhagia are due to anovulatory cycles. A study conducted in Nigeria has estimated that about 12% of adolescents complained of loss of more than 80 ml of blood in each cycle.[6]

We conducted this review with the objective to gather detailed information about the magnitude and causes of abnormal uterine bleeding in adolescents. A systematic literature search was done manually as well as electronically through PubMed, Google Scholar, Cochrane library, IndMed, Embase and WHO databases. We searched for the studies conducted in India. As very few studies were found from India, we extended our search to global studies. Few studies are available on the burden of abnormal uterine bleeding in adolescents and puberty menorrhagia.

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Normal and Abnormal Menstruation in Adolescents

Normal age at puberty is at about 10-11 years for girls.[7] Multiple studies have shown that age of puberty has been continuously decreasing over time.[8] This has increased the prevalence of precocious puberty in current times. The development of pubertal changes before the set limit is called as precocious puberty and currently the age is set at 8 years for girls.[9] Delayed puberty is suspected when there is no evidence of breast development even after the age of 13 years or no menstruation by the age of 15 years.[10]

The length of the normal cycle varies from 20 to 45 days in an adolescent and the mean cycle length is 32 days in first two years after the puberty whereas in adults the normal cycle length ranges from 21-34 days. The 95th percentile for menstrual cycle length in first year is 90 days. So, secondary amenorrhea in adolescents is defined after 90 days.[10]

Menorrhagia in adolescents is generally suspected when there is heavy bleeding causing the need to change the sanitary napkin more frequently than once an hour. Most of the adolescents have periods ranging from 3 to 7 days, any longer duration of bleeding may be pathological. Anovulatory or oligo-ovulatory cycles in adolescent may be associated with menorrhagia, oligomenorrhoea, or interval bleedings (Table 1). Adolescent girls presenting with oligomenorrhoea should be assessed for hirsutism or acne which could point towards PCOS.[11]

Due to the misperception surrounding the AUB, the International Federation of Gynecology and Obstetrics (FIGO) explained AUB to standardize the definition, nomenclature and aetiologies. FIGO has defined AUB 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'.[12]

Much of the manifestation of menstrual problems seen in adolescents is physiological. The main difficulty is to differentiate whether it is physiological or has bordered into pathological. It is very important that the clinicians, as well as the adolescents be made aware about this difference so that treatment can be started.

Causes of Menstrual Problems among Adolescents

Abnormal uterine bleeding in adolescent may be due to a variety of causes like coagulopathies, hormonal imbalance, eating disorders, systemic diseases, etc. The most common cause is anovulatory cycles due to immature hypothalamic-pituitary-ovarian axis.[13] Other causes of anovulation include thyroid disorders, drugs causing hyper-prolactinoma, ovarian insufficiency. Polycystic ovarian disease is also a very common cause of menstrual problem in adolescents.[10] Studies have shown that about 32% - 100% of girls with von Willebrand disease and 10%-70% of girls with other bleeding disorder are prone to heavy menstrual bleeding.[14] Other common causes of AUB among adolescents include eating disorders like anorexia, bulimia, obesity, underweight, etc. hormonal disorders, pelvic inflammatory diseases, trauma, endometriosis, various medications like oral contraceptive pills, danazol, chemotherapy, steroids, etc.[15]

Some studies have been done to find out various causes of menstrual problems and puberty menorrhagia in adolescents. A study conducted by Mohite et al in Maharashtra, India among 230 adolescents. It was seen that 64% of adolescents had regular cycles whereas 36% adolescents had irregular cycles. They also detected the prevalence of different menstrual problems in adolescents. Oligomenorrhoea was seen in 16%, menorrhagia in 17%, metrorrhagia in 27%, dysmenorrhea in 49% and premenstrual syndrome in 46% of study participants.[16]

Table 1. Recommendations on menstrual terminologies[12]

Menstrual disorder	Definition
Disorder of ovulation Oligoovulation Anovulation	 Cycles of more than 35 days/ less than 8 cycles a year Absence of ovulation
Disturbances of regularity Irregular Menstrual Bleeding Absent Menstrual Bleeding (Amenorrhea)	 Abnormal variations in the length of menstrual cycle No menstruation in a 90-day period
Disorder of length of cycle (frequency) Polymenorrhea Oligomenorrhea	 Menstruation occurring more frequently than 21 days Menstruation occurring less frequently than 35 days
Disorder of duration of flow Metrorrhagia Menometrorrhagia	 Bleeding in the intermenstrual period (more than 7 days)
Disorder of amount of flow Menorrhagia Hypomenorrhea	 Increase in amount of flow to 90 ml or more per cycle Decrease in amount of flow to less than 30 ml per cycle

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Study conducted by Basaran HO et al. in Turkey among 36 adolescents showed that about 25% had hematological disorders, 3% had PCOS. In 70% of the participants, no cause was detected.[17] A study was conducted by Gillani and Mohammed in Peshawar, Pakistan among 35 young girls from age of menarche to 19 years regarding the etiology of puberty menorrhagia. They found that 74% of menorrhagia was caused due to anovulatory cycles, 8% due to polycystic ovarian disease and 10% due to bleeding disorders.[18]

Study conducted by Mandal RC et al. in Bengal, India among 200 participants found that 72% cases of puberty menorrhagia were due to anovulatory cycles, 10% was due to PCOS, 8.5% was due to hypothyroidism and 3% was due to bleeding disorders.[19] Study conducted by Sanjay Rao et al found that 80% cases of puberty menorrhagia were due to anovulatory cycle. Other causes like bleeding disorders, thyroid disorders, PCOS, etc. comprised the remaining 20%.[4]

Evaluation and Treatment of AUB

When an adolescent girl presents with menstrual problems, the first priority is to differentiate whether it is physiological or pathological. For this detailed history has to be taken. The questions asked during the visit include age at menarche, length of cycles, duration of bleeding, quantity, colour and consistency of blood, presence or absence of clots and presence of any pain or cramping.[20] Attempt has to be made to discover presence or absence of any psychosocial stressor, any change in eating and exercise habits, recent weight changes, substance abuse. Other symptoms like acne and hirsutism should also be ruled out as PCOS is a common cause of AUB in adolescents. Anovulatory cycle should also be ruled out as it is the commonest cause of AUB in adolescents. Family history of endocrinal disorders should also be questioned. Also, a question about the sexual activity of the adolescent has to be asked in private to rule out the possibility of pregnancy[21] (Table 3).

Physical examinations of such patients include the recording of height, weight, BMI and body habitus. Sexual maturity rating scale should be applied on these patients. On examination the presence or absence of signs of hirsutism should be noted. Signs of other hormonal defects like acanthosis nigricans, striae, thyroid enlargement, etc. are also noted. Typical signs of bleeding disorders like petechiae or bruise, are checked. Breast examination should also be done to check for galactorrhea. Assessment of pubertal stage is done with attention to breast and pubic hair development. In sexually active patient, gynecological exam also has to be performed which includes bimanual examination for uterine and adnexal size and tenderness.[23]

Laboratory workup includes complete blood count, various hormone essays, erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP). Sexually active adolescents are assessed for any sexually transmitted infections like gonorrhea, chlamydia, bacterial vaginosis, trichomonas, and yeast. Urine pregnancy test also has to be performed in these adolescents. In case of girls with heavy bleeding since menarche, bleeding coagulation factor are also assessed along with the work up for von Willebrand's disease.

Treatment of AUB in adolescents is mainly cause - specific. Management can be done at out-patient basis. Hospitalization is indicated only if the patient is hemodynamically unstable. Outpatient management includes giving monophasic combination pills containing 35mcg of ethinyl estradiol. (Table 4) Monophasic contraceptive pills are continued for at least 6 months. Further treatment to be given or not is decided accordingly.

Table 2.Summary of studies on causes and prevalence of different menstrual problems among adolescents

Author	Study type	Objective	Sample size	Results
Mandal RC[19]	Bengal, India Cross-sectional study	Causes of menorrhagia	200	Anovulatory cycle - 72% PCOD - 10% Hypothyroidism - 8.5% Bleeding disorder - 3%
Mohite R and Mohite V[16]	Maharashtra, India Cross-sectional study	Prevalence of Different menstrual problem	230	Oligomenorrhoea - 16%, Menorrhagia - 17%, Metrorrhagia - 27%, Dysmenorrhea - 49% Premenstrual syndrome - 46%
Rao S et al.[4]	Mumbai, Maharashtra Cross-sectional study	Causes of menorrhagia	35	Anovulatory cycle - 80% Others - 20% (bleeding disorder, thyroid disorder, PCOS, etc.)
Gillani and Mohammed[18]	Peshawar, Pakistan Cross-sectional study	Causes of menorrhagia	35	Anovulatory cycles - 74% PCOS - 8 Bleeding disorders - 10%
Basaran HO et al.[17]	Turkey Cross-sectional study	Causes of menstrual problems	36	Hematological disorders - 25% PCOS - 3% No cause detected in 70%

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Table 3.Differential Diagnosis of heavy menstrual bleeding in adolescent[22]

Endocrine causes • Anovulatory cycle • PCOS • Thyroid disorder **Bleeding disorder** • Von Willebrand disease • Platelet dysfunction • Thrombocytopenia • Deficiency of clotting factor **Pregnancy related causes** • Abortion • Ectopic Pregnancy • Gestational Trophoblastic disease	**Infections** • Cervicitis • Adenomyosis **Disorders of uterus** • Myoma • Intrauterine device • Polyps • Cancer **Drugs** • Depot medroxy progesterone acetate • Anti-coagulants **Trauma** **Foreign body**

Table 4.Management of bleeding in adolescent with DUB[21,24,25]

S. No.	Type of bleeding	Management
1.	Mild to moderate bleeding	• Manage anemia with iron supplementation if present • Advice to keep a menstrual calendar to record the cycles • 35mcg ethinyl estradiol tablet, four time a day for 3 days, 3 times a day for 3 days, 2 times a day for 3 days than 1 time daily • OCP continued without break till hemoglobin reaches 11g/dl • Antiemetic pills • Patients contraindicated to estrogen • Norethindrone acetate 5-10 mg or medroxyprogesterone acetate 5-10 mg four times daily followed by tapering to once daily over 2-3 weeks
2.	Severe bleeding	• Admit patient if hemoglobin <8 g/dl or hemoglobin <10 g/dl with persistent heavy bleeding • Fluid bolus and blood transfusion as required in patients who are hemodynamically unstable • Intravenous estrogen 25 mg 4-6 hours for 1 day • Combined oral contraceptive pills to be started just as in moderate bleeding

Conclusion and Recommendation

Abnormal uterine bleeding among adolescents is a neglected problem. Limited information is available on the magnitude and causes of pathological AUB. Since there is a fine line between physiological and pathological events, the ability to differentiate them becomes very important.

It is important to create awareness among young girls and their mothers about this problem. They should also be taught how to differentiate between the physiological and pathological cause of menstrual problem in adolescent, and should be informed when to seek healthcare. The health care providers also need to be trained regarding identification and management of this problem. This may be achieved by incorporating menstrual problems among adolescents in the RCH program along with menstrual hygiene.

Conflict of Interest: None

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