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Abnormal Uterine Bleeding in Adolescent

Kms Yusuf Effendi^{1*}, Rizani Amran¹, Iskandar Zulqarnain¹, Heriyadi Manan¹, Adnan Abadi¹, Fatimah Usman¹, Awan Nurtjahyo¹, Cindy Kesty², Siti Chodijah², Selly Rizany²

¹ Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Sriwijaya/Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

² Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Sriwijaya/Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

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*Corresponding author:

Kms Yusuf Effendi

E-mail address:

yusufspog@yahoo.com

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ABSTRACT

Abnormal uterine bleeding (AUB) is defined as the abnormal bleeding from the uterine corpus in term of duration, volume, frequency and/or regularity. This condition occurs in 37% of adolescents and may affect the quality of life and increased hospitalization. Etiology is divided into structural and non-structural causes, known as PALM-COEIN. The most common etiology in adolescents is anovulatory menstruation due to immature hypothalamus-hypophysis axis. Diagnostic evaluation should include investigation in the etiology of AUB, anemia signs, and hemodynamic status. Treatment of AUB consists of hormonal and non-hormonal therapy. Therapy in adolescent is given based on the severity of bleeding, grading of anemia, and hemodynamic stability. Follow-up is required after therapy. Understanding AUB in adolescents can help clinicians deliver appropriate and comprehensive treatment. This review was aimed to explain about definition, epidemiology, etiology, pathophysiology, diagnosis, and treatment of abnormal uterine bleeding in adolescent.

1. Introduction

Abnormal uterine bleeding (AUB) is defined as bleeding from the uterine body which is abnormal in duration, volume, frequency and/or regularity.¹ The prevalence of AUB in adolescents is higher than in adults (37% vs 10%–20%).^{2,3} This condition causes fatigue or even might need hospitalization that can interfere with quality of life, absence from school, and limited social life.^{3,4} According to International Federation of Gynecology and Obstetrics (FIGO), the etiology of AUB is divided into structural and non-structural which have different treatments.² The understanding about the cause, diagnosis and management of AUB in adolescence could help

clinician administering the best course of action.⁵⁻⁷

Abnormal uterine bleeding

Heavy menstrual bleeding (HMB), previously known as dysfunctional uterine bleeding, is defined as excessive menstrual bleeding that affects the quality of life physically, socially, emotionally and/or materially.² This is not caused by structural abnormalities.¹ Abnormal uterine bleeding occurs in 3–20% of women of reproductive age. The incidence in adolescents is higher than in adults (37% versus 10–20%).² Heavy menstrual bleeding is the most common symptom.⁸ A Swedish study involving 1,000 adolescents found that

73% of adolescents had menstrual disorders and 37% had heavy menstrual bleeding.⁸ Studies showed that the incidence of heavy menstrual bleeding in Nigerian adolescents was 12.1% while in Hong Kong it was 17.9%.⁸

According to FIGO, the etiology of AUB is divided into structural and non-structural which is often known as PALM-COEIN.^{1,7} Structural includes polyp, adenomyosis, leiomyoma, and malignancy/hyperplasia (PALM).^{1,7} Meanwhile, non-structural etiology is COEIN, which are coagulopathy, ovulatory dysfunction, endometrial, iatrogenic and not yet classified. In adolescents, structural abnormalities are very rare, only 1.3–1.7% of cases. Immaturity of the hypothalamic and pituitary axis is common in adolescents causing anovulation and triggering AUB. Anovulatory cycles are the main cause, followed by polycystic ovary syndrome (PCOS), coagulopathy disorders (5–28%), von Willebrand (13%), and iatrogenic causes.^{1,8}

Pathophysiology of AUB in adolescents

The immaturity of the hypothalamic and pituitary axis causes insufficient secretion of LH resulting in inoccurrence of ovulation. Consequently, the endometrium which is continuously exposed becomes hyperplastic. Because the corpus luteum is not formed, progesterone production does not occur. Thus, nothing stabilizes the endometrium and AUB can occur.⁴

Structural changes can cause AUB due to local effects of estrogen, increased vascularity and abnormal peripheral vascularization, increased vascular fragility, release of destructive molecules, vasoconstriction and impaired homeostasis, and also impaired repair of epithelial and endothelial tissue.⁹ Disruption of the endometrial progenitor zone in the basal layer can lead to the formation of abnormal functional layer and disruption of the regeneration process, resulting in AUB.¹⁰

Diagnosis of AUB

Important questions during history taking include menstrual cycle, duration, pain, number of pads a day and premenstrual symptoms. Clinicians can ask about symptoms of anemia (dizziness and weakness) and

contraindication to the use of oral contraceptive pills. Exclude the possibility of ectopic pregnancy, bleeding disorders, pelvic inflammatory disease, PCOS, chronic disorders and drug use.^{2,4} On physical examination, assess the patient's hemodynamics (eg, blood pressure), signs of anemia (eg, pale), and signs of blood abnormalities (eg, bruising). In addition, vaginal and cervical examinations are also performed to find structural abnormalities.^{2,4,6} Laboratory examinations included complete blood count, hematocrit, and pregnancy test. Patients with suspected coagulopathy should also check PT (prothrombin time)/aPTT (activated partial thromboplastin time), PTT (partial thromboplastin time) and fibrinogen levels. To explore structural abnormalities further, assess the structure of the uterine cavity, ovaries and endometrial thickness using ultrasonography (USG). In patients with a history of heavy menstrual bleeding since menarche, check the level of vWF (von Willebrand factor) antigen, ristocetin cofactor activity, and factor VIII level. If there is suspicion of endocrine problem, we should also check thyroid function, prolactin level, free and total testosterone levels, and DHEA-SO₄ (dehydroepiandrosterone sulfate) levels. The patient should have a vaginal swab examination if there is a suspicion of infection.^{1,4}

Management of AUB

The goal therapy in AUB is stabilization of hemodynamic status, correction of anemia and maintenance of normal menstrual cycle. Therapy is divided into hormonal and non-hormonal therapy. In adolescents, the management of AUB is usually given based on the severity of bleeding, the degree of anemia, and hemodynamic conditions.⁴

Light Bleeding

In this category, patients only need to be monitored and may be given non-steroidal anti-inflammatory drugs (NSAIDs) at a dose of 500 mg/dose with 3–5 hours interval and followed by 250 or 500 mg/dose 3–4 times a day. The patient was then asked to return to control after 3 months.^{1,4,10}

Moderate bleeding

At this stage, the patient is given iron supplementation and hormonal therapy. Iron supplementation (60–120 mg) is given for 6 months. A monophasic oral contraceptive pill containing at least 30 mg of ethinyl E2 is given 1 pill every 8–12 hours until bleeding stops, then 1 pill a day for at least 21 days. The dose may be doubled if bleeding begins to occur. After 21 days, gives a placebo for 7 days. Progesterone pills may be given if the patient has contraindication towards estrogen (eg, history of thromboembolism). Oral progesterone is given at a dose of 5–10 mg/day for 12 days at the same time each month. In addition, NSAIDs may be given.^{1,4}

Massive bleeding with stable hemodynamics

Administration of a similar moderate hormone regimen, ie monophasic (ethinyl E2 30–50 mcg) 1 pill every 6–8 hours for 2–4 days followed by 1 pill every 8 hours for 3 days. Then, 1 pill every 12 hours for the next 14 days. Close monitoring and additional iron supplementation are also required.^{1,4}

Massive bleeding with unstable hemodynamics

Patients who are hemodynamically unstable need to be hospitalized and closely monitored.⁴ Oral contraceptive pills are given every 4 hours until bleeding stops, followed by 1 pill every 6 hours for 2 to 3 days. Then, the oral contraceptive pill is given as much as 1 pill every 8 hours for 3 days and followed by 1 pill every 12 hours for 2 weeks. After that, take 1 pill a day until the hemoglobin reaches ≥ 10 g/dL. Cyclic use of oral contraceptive pills is continued for 3–6 months until hemoglobin ≥ 12 g/dL. If heavy bleeding continues after 24 hours of taking the oral contraceptive pill or the patient is unable to take the oral contraceptive pill, the patient is given 25 mg of conjugated estrogen IV/4–6 hours until the bleeding subsides and then the oral contraceptive pill as described previously. If there is contraindication toward oral contraceptive pills, oral progestin can be given.^{1,4}

If bleeding continues for more than 24 hours despite high-dose oral contraceptive pills or if platelet dysfunction is known, give a hemostatic agent such as

tranexamic acid 3.9–4 g a day in 3 doses for 4–5 days. If hormonal and hemostatic agents fail to reduce bleeding within 24–36 hours, we can insert Foley balloon, endometrial sampling and consider therapeutic curettage, ablation or even hysterectomy.^{1,4,8}

Patients are followed up after therapy, if after 3 months of hormonal therapy, the patient doesn't show improvement, or the symptoms occur again after stopping therapy, then evaluate the hypothalamic-pituitary-ovarian axis, PCOS and structural abnormalities. Adolescents with a history of anovulatory cycles for 2–3 years need an endometrial biopsy because of the high risk of malignancy.¹

2. Conclusion

Abnormal uterine bleeding in adolescents is most often caused by anovulatory cycles due to immaturity of the hypothalamic-pituitary axis. Diagnosis should include assessment the cause of bleeding, signs of anemia, and hemodynamic balance. Therapy in adolescents is generally determined by the severity of bleeding, the degree of anemia, and hemodynamic conditions. Follow-up to therapy is also necessary.

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