



ABNORMAL UTERINE BLEEDING: AN OVERVIEW

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Abstract: Abnormal uterine bleeding is characterized by severe menstrual loss which affects women's quality of life in terms of physical, emotional, sexual, and professional elements in their lives. Women may need immediate treatment fluid replacement and prescription of hemostatic drugs in acute and severe cases of bleeding. Surgery may be necessary in certain special cases when it is more difficult and prolonged bleeding. Current International Classification System of Gynecology and Obstetrics (FIGO) and PALM-COEIN were the didactic basis of various treatment options. The following conditions are causes of abnormal uterine bleeding - PALM-COEIN: uterine polyps (P), adenomyosis (A), leiomyomas (L), uterine body precursors and malignant lesions (M), coagulopathies (C), ovulation dysfunction (O), endometrial dysfunction (E), iatrogenic (I) and not yet classified (N). The main goals of treatment are to reduce the menstrual cycle, reduce morbidity and improve quality of life. It is important to emphasize that although the goal of treatment in the acute phase is to stabilize the patient hemodynamically and stop severe bleeding, which is the focus of treatment in the chronic phase, the etiology and clinical symptoms of menstrual dysfunction are discussed. Surgery is an option and treatment mostly focuses on hormone treatment, anti-inflammatory drugs, and antifibrinolytic drugs. In this review article, we discuss about the epidemiology, etiology, pathophysiology, risk factors involved, diagnosis, and various treatment options available for abnormal uterine bleeding in women with acute and chronic bleeding.

Keywords: Abnormal uterine bleeding, Heavy menstrual bleeding, Menstruation, Non-steroidal anti-inflammatory drugs, Antifibrinolytics (hemostatic agents), Quality of life, Hemoglobin.

I. INTRODUCTION:

Abnormal Uterine Bleeding (AUB) is a severe menstrual loss that affects the physical, social, and emotional quality of life ⁽¹⁾. It is detailed in terms of frequency, duration, and changes in the amount of bleeding that differs from the patterns seen during a normal menstrual cycle ⁽²⁾. Amenorrhea is scientifically defined as more than 80 ml of blood loss during the menstrual cycle ⁽³⁾. This blood loss increases the risk of iron deficiency anemia ⁽⁴⁾. AUB prevalence is approximately 9-30% in premenopausal women and approximately 50% in postmenopausal women ⁽²⁾. In India, the prevalence in 2015 was approximately 17.9%. ⁽¹⁾. because AUB can be either acute or chronic, patients can be viewed as an emergency or in outpatient treatment ⁽⁵⁾. Acute AUB requires immediate intervention, unlike chronic AUB, indicating leakage of abnormal amount, regularity, and/or timing has occurred mostly in the last 6 months ^(6, 7). It is accepted that the available literature does not formally distinguish between acute and chronic AUB in non-pregnant women ⁽⁸⁾. The majority of recommendations do not apply to this age group, making diagnosis and treatment difficult ⁽⁹⁾. Therefore, care should be taken, as treatment is based on proven evidence in adults and there is no significant direct evidence to support the extrapolation ⁽¹⁰⁾. In addition, several studies have identified differences in treatment strategies for acute AUB in different countries' specialties, reflecting a lack of standardized care ⁽¹¹⁾. Doctors should explain to patients and their caregivers, what to expect in the first period, especially for patients with known blood disorders ⁽¹²⁾. These patients should seek advice from a gynecologist or hematologist before menstruation ^(9, 13, and 14). In the post-menarche study, the last period of menstruation, menses, and blood loss should be evaluated as if they were clinical vital signs ⁽¹⁴⁾. Menstrual cycle disorders, formerly known as Dysfunctional Uterus (DUB) and Menorrhagia are now better described as abnormal uterine bleeding (AUB) ⁽⁸⁾.

II. EPIDEMIOLOGY AND ETIOLOGY:

AUB has been reported to occur between menses and menopause in 9-14% of women ⁽¹⁵⁾. In India, the prevalence of AUB is approximately 17.9% ⁽¹⁶⁾. Descriptive terms Menorrhagia (severe or prolonged) was used to characterize AUB patterns regular menstrual cycle), uterine bleeding (irregular bleeding between cycles) and polymenorrhea (menstruation lasting less than 24 days) and menstrual bleeding (increased menstrual cycle) ⁽¹⁷⁾. The new system is known by the acronym PALM-COEIN (polyps, adenomyosis and leiomyoma, malignant tumors and hyperplasia, coagulation disorders, ovulation disorders, endometrium Factor, Iatrogen, Unclassified) launched in 2011 by International Women's Founded. Obstetrics and Gynecology Association FIGO.) introduced ⁽⁷⁾. However, the concept of "menorrhea", i.e. no menstrual bleeding within 6 months of the initial period, remains. Figure 1: PALM-COEIN system is etiological and PALM describes structural causes and COEIN is discounted to non-structural causes of AUB. (Table 1) provides a summary PALM-COEIN rating system. In addition, the FIGO nomenclature summarizes parameters to describe normal and abnormal menstrual limits (Table 2). In Fig 1 the nomenclature system thus allows for standardization and consistency in future administration research and can resolve inconsistencies in AUB management.

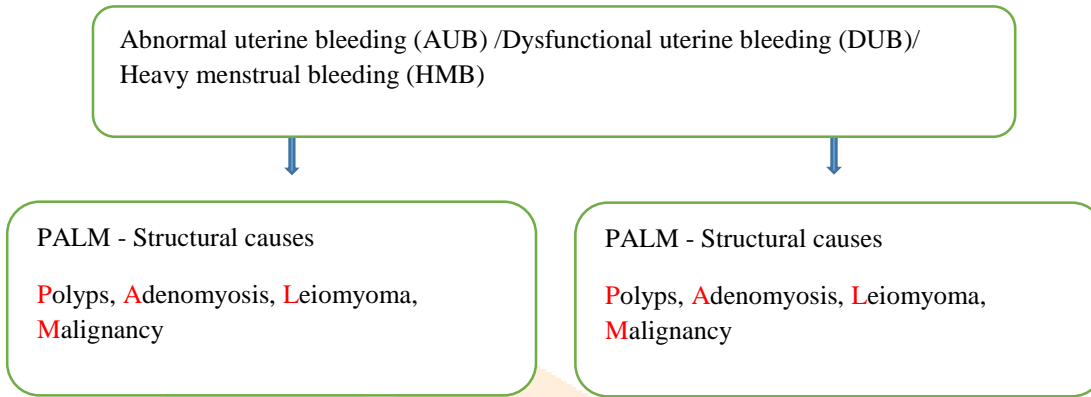


Fig 1: If the abbreviation PALM-COEIN is present, the disorder AUB can be diagnosed ⁽⁷⁾

Table 1: The International Federation of Gynecology and Obstetrics (FIGO) proposed the PALM-COEIN Classification of Etiology of Abnormal Uterine Bleeding ⁽⁷⁾

AUB Causes	Subclass	Characteristics
Structural causes	Polyps (AUB-P)	a) Both in the endometrium and the endocervical canal b) Classified as either present or absent
	Adenoma (AUB-A)	Although where it started is uncertain, ultrasonography examination can identify the condition.
	Leiomyoma (AUB-L)	0: Submucosal types have no impact on the endometrial cavity Others: 1: 50% intramural 2: 50% intramural 3: 100% intramural, fully intracavitary, but relying on the endometrium 4: Completely internalized intramural leiomyomas of the myometrium 5 : At least 50% intramural and subserosal 6 : 50% intramural and subserosal 7: Serosa-attached by a stalk and subserosal Include parasitic lesions, lesions in the round or broad ligaments without a direct relationship to the uterus, and cervical lesions that do not involve the myometrium.
	Malignancy & hyperplasia (AUB-M)	a) Ovulatory dysfunction may be the cause b) Sub-classification under the WHO or FIGO system.
	Coagulopathy (AUB-C)	a) Coagulopathy represents both inherited and acquired b) Most common is inherited von Willebrand disease
	Ovulatory dysfunction (AUB-O)	Can result in severe menstrual bleeding or amenorrhea.
	Endometrial (AUB-E)	When additional anomalies are ruled out and normal ovulatory activity is present.

Non-Structural causes	Iatrogenic (AUB-I)	Breakthrough bleeding when using intrauterine systems or devices, dopamine-metabolism-interfering medications, single or combined gonadal steroid therapy, or anticoagulants.
	Not classified (AUB-N)	Chronic endometritis, arteriovenous malformations, and myometrial hypertrophy are uncommon or ill-defined conditions.

III. SIGNS AND SYMPTOMS ⁽⁷⁾

The common signs and imaging characteristics of menorrhagia are discussed in Table 2:

Table 2. Common symptoms and imaging features of abnormal uterine bleeding ⁽⁷⁾

Class	Symptoms	Signs	Imaging
Polyp	Intermenstrual bleeding, prolonged bleeding, pallor, and infertility	The uterus is usually normal size, but if it is large, it is the cervix and may be mottled, with polyps sticking out	Appears to have thickened endometrium Saline injection ultrasound - echogenic smooth intraluminal mass delineated by fluid
Adenomyosis	Heavy menstrual bleeding, marked dysmenorrhoea	Uterus enlarged up to 12 weeks Uniformly enlarged, Globular May or may not be tender	Globular uterine enlargement (not due to leiomyoma) by 18 weeks Thickening of the uterine wall. Multiple hypoechoic halo zones ≥ 12 mm thick. The uneven texture of the endometrium
Leiomyoma	Submucosal -prolonged uncontrolled bleeding, an intramural variable amount of HMB, subserosal - may be asymptomatic.	Irregularly enlarged uterus Fixed	A clear, firm mass with a whorled appearance. Echogenicity similar to the myometrium, possibly hypoechoic changes in the normal uterine contour of the uterus 3D USG – precise localization in selected patients MRI fibroid mapping if required
Malignancy	Postmenopausal bleeding, irregular bleeding patterns during peri-menopause	A uterus that is slightly enlarged from normal and may have limited mobility	United States - Endometrial Hyperplasia - Thickening of the endometrium greater than 12 mm at premenopausal age
Coagulopathy	Menorrhagia in puberty, heavy bleeding at menarche, medical history suggestive of bleeding diathesis, family history.	Normal size uterus Pale Squeezing Petechiae	Routine scan Possible hemorrhagic cyst in the ovary
Ovulatory Disorders	Symptoms of polycystic ovarian anovulation syndrome Symptoms of Oligomenorrhea Symptoms of insulin resistance	Uterus normal size	Polycystic ovaries on ultrasound Thickened endometrium
Endometrial	Inter-menstrual spotting Long-term spotting	Discharge around the vagina Cervical erosion	Normal-sized uterus Fluid in the endometrial cavity
Iatrogenic	Cu-T medication history	No abnormality	Copper T in normal-sized uterine sites
Not Classified	HMB	Refer to PALM-COEIN	Ultrasound, Doppler, USG- for AVM
3D-USG: 3 dimensional ultrasonography; HMB: Heavy menstrual bleeding; MRI: Magnetic resonance imaging; AVM: Arterio venous malformation			

IV. PATHOPHYSIOLOGY:

In the pathophysiology of AUB, both estrogen and progesterone stimulate the prostaglandin pathway. Estrogen stimulates tissue plasminogen activator (TPA), which is fibrinolytic and can cause bleeding, and also activates prostaglandin E2 (PGE2) and prostaglandin I2 (PGI2), which have vasodilation properties and stimulates platelet aggregation, causing bleeding. Progesterone stimulates PG F2 and thromboxane A2, which have vasoconstrictor properties that stimulate platelet aggregation and thus stop bleeding⁽¹⁾.

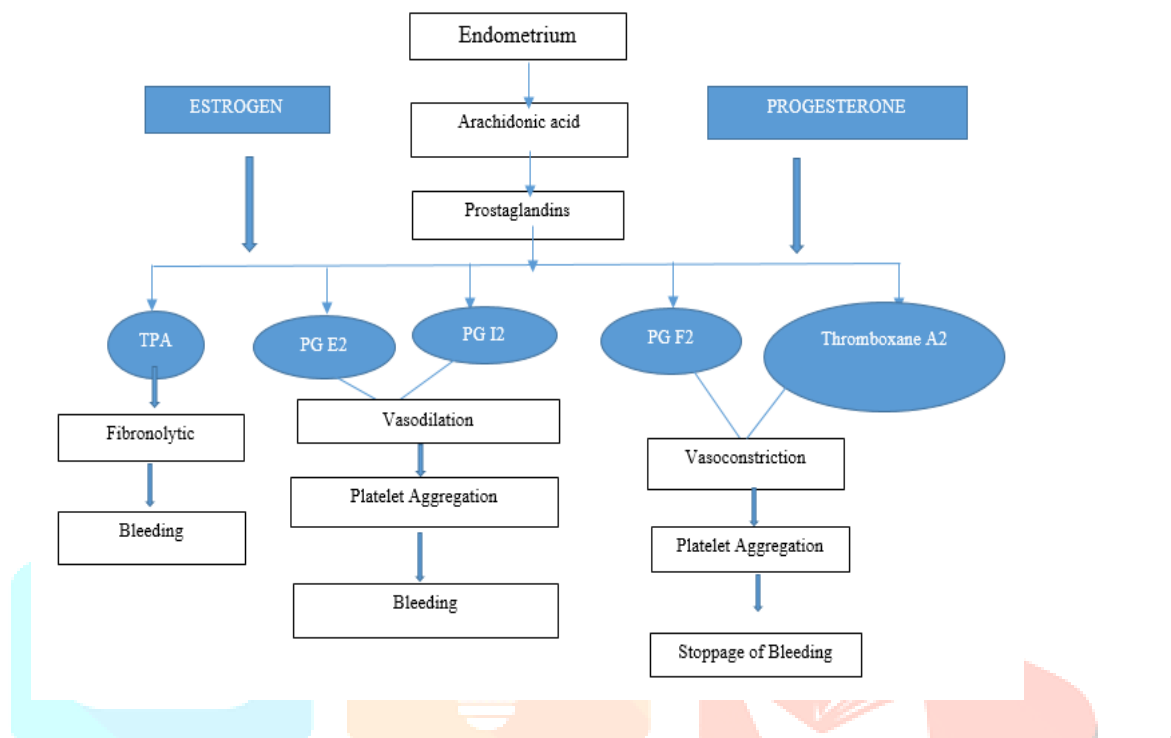


Fig.2 Pathophysiology of AUB⁽¹⁾

V. PROCEDURES^(1, 18)

- Complete blood count (CBC).
- Physical examination of the pelvis and vagina
- Evaluation of the endometrium
- Dilatation and curettage
- Endometrial biopsy
- Abdominal and pelvic ultrasound
- Sonography of saline infusion
- Hysteroscopy and hysteroscopy-guided biopsy
- Hormone assessment tests

VI. RISK FACTORS⁽¹⁹⁾

- Liver and kidney diseases
- Obesity
- PCOS (Polycystic Ovarian Syndrome) / PCOD (Polycystic Ovarian Disease)
- Anticoagulation therapy / Factor Xa inhibitors
- Use of Tamoxifen (a class of anti-estrogen drugs).
- Thyroid diseases
- Consequences of iron deficiency, chronic anovulation or infertility, urination, hypertension (HTN), diabetes mellitus (DM), and AUB include infertility, uterine cancer, and anemia.

VII. PHARMACOLOGICAL MANAGEMENT:

In addition to hemostatic control of bleeding, pharmacological treatment of AUB is based on the effects of hormones and other inflammatory mediators on the endometrium (Table 3)^(20, 21). The options are:

3.1 Hormonal:

- Combination of estrogen and progestin
- Oral or injectable progestin
- Levonorgestrel-releasing intrauterine system (LNG-IUS)
- Other treatments or options

3.2 Non-hormonal:

- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Antifibrinolytic agents / hemostatic therapy.

Table: 3 Pharmacological treatment for acute and chronic abnormal uterine bleeding

Medication	Management		Efficiency
Hormonal			
Acute bleeding		Chronic bleeding	
Combined oral contraceptive	30 mcg or 35 mcg ethinyl estradiol-containing contraceptives 7 days at 1 tablet /day, taken every 8 hours, followed by 3 weeks at 1 tablet/day.	In the package insert, there are 3 different combinations: combined oral, combined transdermal, and combined vaginal rings.	High
Oral progestogen	20 mg of Medroxyprogesterone acetate every 8 hours for 7 days.	Oral medroxyprogesterone acetate (2.5–10 mg), norethisterone acetate (2.5–5 mg), megestrol acetate (40–320 mg), micronized progesterone (200–400 mg), and dydrogesterone (10 mg) at the doses suggested in the package insert. No ovulatory dysfunction: 1 tablet every day from the 5th to 26 th day of the cycle, or constantly. With ovulatory dysfunction: Every 4 weeks, use for 2 weeks while adjusting the dose/day.	High
LNG-IUS	-	Every 5 years, insert the intrauterine device that releases levonorgestrel at a rate of 20 mcg per day.	High
Depot Medroxyprogesterone acetate	-	Every 12 weeks, 150 mg is intramuscularly administered.	Low/ Moderate
Gonadotropin-releasing hormone analog	-	Goserelin (3.6 mg monthly or 10.8 mg quarterly) or subcutaneous leuprolide acetate (3.75 mg monthly or 11.25 mg quarterly).	High
Non-hormonal			
NSAID's	-	Ibuprofen 600 to 800 mg every 8 hours, or mefenamic acid 500 mg every 8 hours.	Moderate
Tranexamic acid (Antifibrinolytics)	-	<ul style="list-style-type: none"> • Swedish Medical Products Agency (MPA): Oral administration of 1 to 1.5 g, 3 to 4 times per day, for 3 to 4 days (up to 1 g, 6 times per day is possible). • European Medicines Agency (EMA): 1 g taken 3 times daily for 4 days (the amount may be raised, but only up to a maximum of 4 g). • The US Food and Drug Administration (FDA): 1.3 g, 3 times per day for up to 5 days, or 10 mg/kg intravenously (with a 	High

		maximum dose of 600 mg/dose, every 8 hours, for 5 days [in cases of bleeding without structural injury]).	
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Source: Bradley LD, Gueye NA. Medical management of abnormal uterine bleeding in women of childbearing age. *I am J Obstetric Gynecologist*. 2016; 214(1):31–44(20); Karakus S, Kiran G, Ciralik H. Efficacy of micronized vaginal progesterone in the treatment of irregular dysfunctional uterine bleeding with oral dydrogesterone: a randomized controlled pilot study. *Aust N Z J Obstetric Gynaecology*. 2009; 49 (6): 685–8 (22); American College of Obstetricians and Gynaecologists. ACOG Committee Statement no. 557: Treatment of acute abnormal uterine bleeding in nonpregnant women of childbearing age. *Obstetrics and Gynecology*. 2013; 121 (4): 891–6 (21).

3.1 HORMONE THERAPY:

3.1.1 COMBINED ESTROGEN AND PROGESTIN:

Estrogen-progestin combined oral contraceptives (CC) reduce menstrual blood loss by 35–72% without causing structural changes and are a treatment option for most causes of AUB^(23, 24, 25). COCs reduce the frequency of periods and are often offered cyclically with breaks, although they can also be used continuously. Levonorgestrel-related formulations containing 30 micrograms of ethinyl estradiol are more common, although alternative formulations could theoretically be used. Various combinations in different regimens, either oral or vaginal rings, have been shown to reduce bleeding. Given the multiplicity of associations, comparisons are difficult, although studies have shown single-step oral regimens to be more effective than mefenamic acid, naproxen, or danazol. In addition, continuous regimens used cyclic use of combinations^(23, 26). In 2012, the US Food and Drug Administration (FDA) approved the use of a formulation containing dienogest in combination with estradiol valerate to reduce menstrual bleeding⁽²⁷⁾.

3.1.2 ISOLATED SYSTEMIC PROGESTIN:

The hormone progesterone, which is produced in the body of a woman during the luteal phase of the menstrual cycle, is responsible for the change in the secretion of the endometrium. If fertilization does not occur, estrogen and progesterone levels drop and menstruation begins. The mechanisms by which progesterone shrinks the endometrium and exerts anti-inflammatory effects continue to be elucidated. They can be helpful for most women, but those who cannot or cannot use estrogen should be careful when using them. Progestogens come in a variety of forms and dosages, including continuous, cyclic, oral, injectable, and intrauterine. Unexpected bleeding caused by endometrial contraction is the major disadvantage of long-term progestin-only use⁽²⁸⁾.

3.1.3 CYCLIC OR CONTINUOUS ORAL PROGESTIN USE:

Cyclic use of progestogens is probably the most controversial of hormonal treatments and does not appear to be the best treatment for controlling uterine bleeding⁽²⁰⁾. Studies show that cyclic use of norethisterone (oral dose 7-10 days per month) increases menstrual flow by 20%⁽²⁹⁾. The levonorgestrel-releasing intrauterine system and LNG-IUS combined oral contraceptives (COCs), and antifibrinolytics are all superior to cyclic use of progestogens, according to a comprehensive literature review⁽³⁰⁾. Ovulation disorders, especially in anovulatory women who do not want to get pregnant and cannot use other hormonal treatments, are a hallmark of AUB. Administration of oral progestogen for 12-14 days per month, simulating the luteal phase of the menstrual cycle, would benefit these patients⁽²⁸⁾. By comparing the use of 90 mg of vaginal micronized progesterone from days 17 to 27 of the menstrual cycle with the use of 20 mg of oral dydrogesterone from day 15 of the menstrual cycle for 10 days, researchers were able to identify women who were pregnant. Bleeding This showed that the reduction of the menstrual cycle and the presence of secretory endometrium after both treatments were comparable. After three months, there were similarities between the groups in terms of treatment satisfaction and occurrence of regular cycles⁽²⁹⁾.

3.1.4 CONTINUED USE:

Oral progesterone successfully reduces bleeding and can sometimes stop bleeding that can cause amenorrhea in some women. Its purpose is to cause endometrial atrophy, which reduces the effect of estrogen on endometrial proliferation. It may be recommended for women with endometrial discharge, whether or not they are ovulating. Formulations listed in the literature include oral megestrol acetate (40 mg and 320 mg daily), norethisterone (2.5 mg and 5 mg daily), micronized progesterone (200 mg and 400 mg daily), and oral medroxyprogesterone acetate (2.5 to 10 mg daily), which can be taken continuously or from day 5 to day 26 of the cycle. Days 5-26 of the menstrual cycle. During the day, norethisterone is prescribed at a dose of 5 mg three times a day⁽³¹⁾.

3.1.5 INJECTABLE PROGESTIN:

Medroxyprogesterone acetate 150 mg IM every three months) in AUB is not definitively supported by available data. However, some studies show that it can cause amenorrhea in up to 24% of women, indicating that it may be a good choice for women who bleed more than usual. Side effects often cause users to stop taking the drug due to irregular bleeding, weight gain, and headaches⁽³²⁾. Subdermal etonogestrel implant: The utility of etonogestrel implants in AUB has not been adequately studied (28).

3.1.6 LEVONORGESTREL-RELEASING INTRAUTERINE SYSTEM (LNG-IUS):

The LNG-IUS releases levonorgestrel at doses of 20 micrograms per day, which causes endometrial thinning and bleeding through several mechanisms. It is believed to be more effective than oral medications in controlling AUB⁽²⁸⁾. The LNG-IUS appears to be well tolerated, with longer treatment duration and lower incidence of side effects, as well as reduced bleeding (71-96%)⁽³³⁾ and improved quality of life⁽³⁴⁾. The most commonly reported side effect is unexpected bleeding, which is especially common during the first 5 months of treatment. Tranexamic acid or anti-inflammatory drugs may be useful in this situation⁽³⁵⁾. The LNG-IUS and endometrial ablation were compared, and although the LNG-IUS had fewer side effects and was less expensive, the improvement in satisfaction and quality of life was comparable. Even with LNG-IUS use, abnormal hysterectomy bleeding has occurred⁽³⁶⁾.

3.2 NON-HORMONAL TREATMENT:

Anti-fibrinolytic or non-steroidal anti-inflammatory drugs (NSAIDs) are used in the non-hormonal treatment of AUB. It is especially recommended for women who want to get pregnant and do not want to use hormones or who cannot use them for medical reasons⁽²⁸⁾.

3.2.1 NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS):

In adult patients, nonsteroidal anti-inflammatory drugs (NSAIDs) reduce menstrual blood loss and may be given for less bleeding^(7, 36). However, it is less effective than other treatments^(5, 36, and 37) Ibuprofen 600-1200 mg daily,

Naproxen 250-500 mg every 12 hours, and mefenamic acid 500 mg every 8 hours are some examples of regimens^(7, 14). Patients with blood disorders should avoid them because they negatively affect platelet aggregation and increase the clotting factor^(14, 14, 38, and 39).

3.2.2 ANTIFIBRINOLYTIC AGENTS / HEMOSTATIC THERAPY:

By inhibiting fibrinolysis and promoting clot formation, antifibrinolytic drugs significantly reduce menstrual blood loss (40-50%)^(5, 15, 39, 41, 42-44). If a person cannot be treated with hormone therapy alone^(40, 45), antifibrinolytics can be used. Women should take tranexamic acid, which can be given orally three times a day for up to five days at a dose of 1300 mg or 10 mg/kg intravenously every eight hours^(5, 40, and 46). Antifibrinolytic drugs should not be used in patients with disseminated intravascular coagulation, venous or arterial thromboembolism, severe haematuria, severe renal impairment, early pregnancy, or reduced color vision^(47, 48). Clinicians should be aware that concomitant use of oral contraceptives is listed as a contraindication in the prescribing information for tranexamic acid due to the potential risk of thrombosis^(49, 50). Desmopressin acetate, a synthetic version of the antidiuretic hormone vasopressin, has been used to treat uterine bleeding disorders in women with clotting disorders, particularly those with von Willebrand disease (VWD) and mild hemophilia A⁽⁶⁾. It improves platelet adhesion and promotes the endothelial release of VWD and factor VIII^(6, 10, 41, 45, and 47).

3.3 OTHER OPTIONS:

3.3.1 GnRH AGONISTS: (GONADOTROPIN-RELEASING HORMONE)

In severe HMB symptoms, GnRH agonists may help temporarily relieve symptoms^(6, 45, 51). Because of its adverse effects, which include vasomotor symptoms and decreased bone mineral density in young adults, it should not be used⁽⁵⁾. For girls with severe blood disorders such as Glanzmann thrombasthenia, Bernard-Soulier syndrome, or oncological correlates that have not responded to previous treatment, adjuvant therapy (adding estrogen and/or progestin therapy) is a last resort^(5, 10, 14, 36, 39, 51).

3.3.2 PHARMACOLOGICAL TREATMENT OF ACUTE AUB:

The severity of the patient's anemia determines the most appropriate drug dose⁽⁷⁾ the dose and timing of administration of estrogen and progestin varies widely and there is no clear consensus in the literature.

3.3.2.1 NORMAL HEMOGLOBIN (12-16 g/dl):

Observation and certainty are usually sufficient. Anti-inflammatory drugs can help reduce blood flow⁽³⁶⁾. Patients should be encouraged to keep accurate records of periods of maintenance therapy^(46, 49)

3.3.2.2 MILD (10-12 g/dl):

Single-phase combined oral contraceptives containing 30-35 mcg of ethinyl estradiol should be taken twice a day for the first 21 days after the bleeding has stopped^(7, 40). Progestins cannot be used, norethisterone acetate (5-10 mg) can be taken orally until bleeding stops. The association with anti-inflammatory drugs may be beneficial⁽⁴⁰⁾. It is recommended to take iron supplements^(7, 14, and 40).

3.3.2.3 MODERATE (8–10 g/dl):

During the first 2 days, you should take 1 tablet of the monophasic combined contraceptive pill (30-35 micrograms of ethinyl estradiol) every 6 hours, then 1 tablet every 8 hours. Then, after skipping the placebo for the first two days, a new pack of active pills was started and continued once daily^(14, 36). If bleeding returns after reducing the dose, take the pill twice a day for the remaining 21 days of the cycle⁽¹⁴⁾.

Antiemetic medications such as promethazine 12.5–25 mg or ondansetron 4–8 mg are recommended before high-dose hormone therapy to prevent nausea and vomiting^(10, 36, and 53). Progestin is given by mouth every 8-12 hours until the bleeding stops, and then the dose is gradually reduced every week until it becomes daily⁽⁷⁾. Patients who refuse hormone therapy can use tranexamic acid as an alternative⁽⁵⁾. All patients should receive additional iron.

3.3.2.4 SEVERE (≤ 7 g/dl):

Blood transfusion should be considered⁽³⁶⁾. Hormonal treatment guidelines are the same as for mild anemia, but it may be necessary to take one combined oral contraceptive pill (COC) every 4-6 hours until the bleeding stops, which can take up to 24-36 hours. Take one pill every 8 hours for 3 days until the hematocrit exceeds 30%⁽¹⁴⁾. Another option is high-dose estrogen therapy: 4 mg every 6 hours for 24 hours, then 2 mg every 6 hours for 2 days, every 8 hours for 2 days, and every 12 hours for 2 days, then daily every day. To stabilize estrogen-stimulated endometrial development, an oral progestin should be administered in addition to estrogen for 10–14 days^(6, 46). Antiemetics should be given before starting. If bleeding occurs again during tapering, the dose can be temporarily increased to the lowest dose that stops the bleeding^(7, 14). Norethisterone acetate can be used as an alternative to progestins. It should be taken orally in doses of 5-10 mg every 6 hours for 4 days, 3 days, and 2 weeks⁽¹⁴⁾. Another option is medroxyprogesterone acetate 10-20 mg orally every 6-8 hours for 1 week, then 1 tablet twice daily for 1 week, then once daily^(5, 14).

3.3.3 SURGICAL PROCEDURES:

Surgery is performed only when all other treatments have failed within 24-36 hours or when a life-threatening emergency has occurred^(36, 49). Some treatments are more suitable for young people who want to preserve their fertility. Inspection may be more difficult and reveal some injuries while the patient is asleep^(5, 38, and 49). It has been suggested that young people with chronic bleeding undergo mechanical intrauterine tamponade to reduce postpartum bleeding^(40, 50). A 16- or 18-gauge Foley catheter with a 30 cc balloon is then inserted into the uterine cavity and filled with saline until the bleeding stops with compression. This is done after removing a clot^(5, 10, 38, and 40). Dilatation of the cervix can be performed^(10, 13, 14, 38, and 40). It may be useful to use a hard tool⁽⁹⁾ attached to the end of the catheter to guide the insertion of the catheter. When resistance is reached and bleeding stops, saline is pumped into the balloon^(10, 50) later. Ultrasound should be used to locate it and should only be left for 24 hours⁽¹⁰⁾. Some authors recommend taking antibiotics as a preventive measure⁽¹⁰⁾. Although treatment is rarely necessary for young adults, it can be a therapeutic and tissue-testing tool^(10, 38, and 41). Uterine embolization should be considered a last resort and a life-saving procedure to avoid hysterectomy^(10, 36, 38, and 41).

VII. ACKNOWLEDGMENT:

I would like to thank my guide Mrs. Sathya prabha G, Assistant Professor, KMCH College of Pharmacy, Coimbatore and I would also extend my thanks to my college management, KMCH College of Pharmacy, Coimbatore.

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