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The teenager with heavy menses

Heavy irregular menses in adolescence is a common problem that can have a significant impact on a teenager's quality of life. GPs, paediatricians and gynaecologists are well placed to diagnose these disorders and provide treatment, education and follow up.

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Heavy irregular menses in adolescence is a common problem that can have a significant impact on a teenager's quality of life. Conversely, a teenager's life can have a significant impact on her menstrual cycle. Although anovulation is the most common cause of menorrhagia in teenagers, other serious and occasionally life-threatening conditions can present with abnormal vaginal bleeding. GPs, paediatricians and gynaecologists are well placed to diagnose these disorders and provide treatment, education and follow up.

Definitions

The normal menstrual cycle varies from 21 to 35 days. The average amount of menstrual blood loss is 30 to 40 mL over a period of three to seven days. Menorrhagia is defined as bleeding 80 mL or more per period and which occurs at regular cyclic intervals. Menorrhagia can, therefore, lead to iron deficiency anaemia. Heavy bleeding can occur regularly or irregularly or can present as prolonged menses.

Assessing the heaviness of menses is difficult and patient self-reporting can be unreliable. A woman's perception of normal is influenced by personal experience. For adolescents, the perception of normal may be quite variable given their limited knowledge of what is normal. The frequency of sanitary pad changes, which is often used as a gauge of heaviness, varies depending on the patient's comfort, as well as the capacity of different brands of pads and tampons. However, bleeding that requires a pad or tampon change every one to two hours, with anything longer resulting in 'flooding' or 'accidents' is generally considered excessive, especially if menses last eight or more days.[1,2] The pictorial blood assessment chart (see the patient handout on page 37) is a semi-objective way of quantifying the amount of blood loss per menstrual cycle by recording the number and saturation of

IN SUMMARY

- **The most common cause of heavy menses in adolescents is anovulation due to an immature hypothalamic pituitary ovarian axis.**
- **Bleeding disorders such as thrombocytopenia, platelet dysfunction and von Willebrand disease should be considered in a young woman who presents with menorrhagia, especially with her very first period.**
- **A pelvic examination is not always required to manage heavy menses in adolescents.**
- **Nonhormonal treatments such as NSAIDs and tranexamic acid can be very effective for adolescents with menorrhagia.**
- **Hormonal management (e.g. combined oral contraceptive pill or oral progestins) may be a good long-term option for adolescents with heavy menses.**

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Table 1. Common causes of heavy vaginal bleeding in adolescents

Anovulatory bleeding

Bleeding disorders
Clotting disorders (e.g. von Willebrand disease, disorders of platelet function)

Pregnancy-related causes
Spontaneous abortion
Ectopic pregnancy

Endocrine disorders
Polycystic ovarian syndrome
Ovarian failure
Hypo- or hyperthyroidism
Hyperprolactinaemia
Diabetes mellitus
Cushing syndrome
Congenital adrenal hyperplasia

Infections
Chlamydia
Gonorrhoea

Thrombocytopenia
Idiopathic thrombocytopenic purpura
Chemotherapy

Pelvic inflammatory disease

Systemic diseases
Chronic Illness
Eating disorders
Malignancy (e.g. leukaemia)

Medications
Hormonal contraceptives
Anticoagulants
Platelet inhibitors

Other causes
Psychosocial stress
Significant level of sporting activity
Drug abuse

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sanitary pads or tampons. Although it has never been validated in adolescents, a score greater than 100 in adults has been shown to have a reasonable accuracy in identifying menorrhagia.[3]

Causes

Anovulation due to an immature hypothalamic pituitary ovarian axis is the most common cause of heavy menses in adolescents. Unopposed oestrogen secretion results in an unstable endometrium that sheds irregularly. Ovulatory cycles with cyclic progesterone production may take up to three years to become established. This diagnosis is, however, a diagnosis of exclusion.

Other causes of anovulation should also be considered because this will affect the choice of treatment. These causes include chronic illness, eating disorders, psychosocial stress, significant level of sporting activities, drug abuse, pituitary tumours, androgen excess (e.g. polycystic ovarian syndrome [PCOS], late onset congenital adrenal hyperplasia) and other endocrinopathies such as hypothyroidism, hyperthyroidism, diabetes mellitus and Cushing syndrome (see Table 1).

Since pregnancy, and its complications, as well as sexually transmitted infections can cause heavy bleeding in young women, it is important to obtain a sexual history from all adolescents. However, situations may be such that this can be difficult to do. Therefore, regardless of the stated sexual history, it is imperative to rule out pregnancy.

Bleeding disorders such as thrombocytopenia, platelet dysfunction and von Willebrand disease should be considered in a young woman who presents with menorrhagia, especially with her very first period. The actual prevalence of bleeding disorders in adolescents with menorrhagia has been reported to be between 10.4% and 48%.[4,5] Some of this discrepancy in reported rates of bleeding problems relates to the study population, with some reports including patients taking chemotherapy and warfarin,[6] and others excluding patients with known causes for heavy menses.[5] In the general community, von Willebrand disease is reported

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Table 2. HEADSS assessment: a psychosocial interview for adolescents*

Home	
	Where do you live?
	Who lives with you?
	How do you get along with your parents and siblings?
Education	
	Are you in school? What grade?
	What subjects do you enjoy?
	How well is school going?
	What are your goals when you finish school?
Activities	
	What do you like to do outside of school?
	What do you do for fun and with whom?
Drugs	
	Have you ever tried any drugs, including alcohol?
	If so, how often?
	Have you ever tried intravenous drugs?
Sexuality	
	Are you in a relationship?
	Do you prefer men, women or both?
	Have you ever had vaginal sex, oral sex or anal sex?
	Have you ever been forced to have sex?
Suicide and depression	
	Do you ever feel really sad? If so, how long does it last?
	Have you ever been depressed?
	Have you ever had thoughts of hurting yourself?

* Adapted from Goldenring J, Cohen E. Getting into adolescents heads. Community Pediatrics 1988: 75-80.

to affect 1% of the population. Although patients with bleeding disorders often have other features of bleeding such as epistaxis or easy bruising, the teenager with von Willebrand disease may not have a history of such injuries or have had prior surgery.

Medications such as anticoagulants and platelet inhibitors can also cause excessive bleeding. Tumours, either benign or malignant, and polyps are rare causes of heavy bleeding in the adolescent population and can be detected on pelvic examination or ultrasound. These diagnoses need to be considered, particularly in cases in which management is proving difficult.

Assessment

It is crucial that all consultations in teenagers are undertaken with appropriate care. Using an approach such as the HEADSS assessment will enable you to explore sensitive issues (see Table 2). Ensuring that the young woman is aware that the consultation is confidential will also increase the likelihood of open disclosure.[7] Framing questions in a broad manner and avoiding questions that require a 'yes' or 'no' answer is important. Additionally, appreciating the impact of heavy periods on a teenager's life will affect management decisions: missed days of school and inability to participate in sporting and social activities are clearly important. A teenager's life will also impact on management decisions. For example, the teenager who binge drinks and has an erratic lifestyle is unlikely to be compliant with daily medications.

History

The teenager who presents with heavy periods requires a careful evaluation, including not only details of her menses but also general adolescent issues. The patient should be asked how old she was when she had her very first period, the usual pattern of bleeding (frequency and duration), the presence of any menstrual cramping or premenstrual syndrome-like symptoms, as well as the date of her last menstrual period.

A complete medical history should be taken, including any medications being taken. At some point during the consultation, she should be asked in confidence about her sexual contacts (consensual or nonconsensual), her use of contraception and whether she has ever had a sexually transmitted infection. A review of systems should attempt to rule out some of the causes of anovulation by ascertaining the presence of specific signs and symptoms – for example, acne, hirsutism, acanthosis nigricans, weight gain/loss, other weight changes, cold or heat intolerance, regularity of bowel movements, gingival bleeding, epistaxis, bruising, psychosocial stressors, eating habits, intensive athletics or a family history of bleeding disorders.

Physical examination

A physical examination may provide more clues towards the cause of menorrhagia. Assessing the height and weight of the patient and determining her body mass index is always important. Detecting signs such as obesity, hirsutism, acne and/or acanthosis nigricans can be suggestive of PCOS. Thyroid nodules or enlargement can also help diagnose thyroid disorders, whereas bruising and petechiae can be suggestive of bleeding disorders.

A full gynaecological assessment with digital examination and speculum examination does not need to be performed for all patients. Patients who have been sexually active may be amenable to this type of examination, if the need for it is explained. If a speculum examination is undertaken, cervical cultures should be obtained. However, it is possible to perform a first-catch urine polymerase chain reaction (PCR) test to diagnose chlamydia in the young woman who is sexually active but is uncomfortable about a speculum examination. A pelvic ultrasound can provide important information regarding the size of the uterus (presence of tumours), the thickness of the endometrial lining, the size of the ovaries and any associated cysts or masses. Assessing the thickness of the endometrial lining is useful in guiding therapy, but may be difficult with a transabdominal ultrasound.

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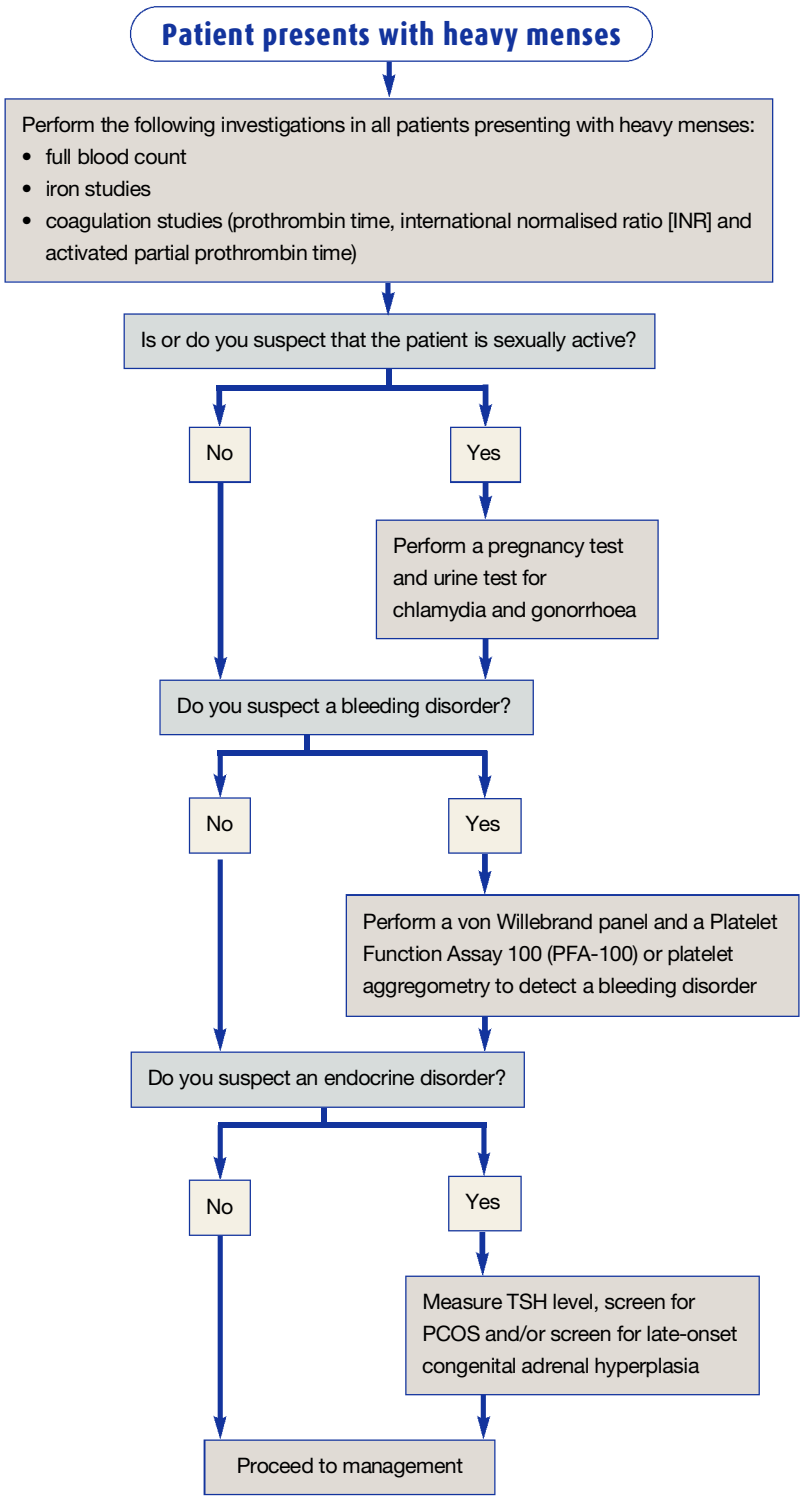
Basic investigations for adolescents with heavy menses



ABBREVIATIONS: PCOS = polycystic ovarian syndrome; TSH = thyroid stimulating hormone.

Investigations

Basic investigations for young women presenting with heavy menstrual bleeding should include a full blood count including platelet count, iron studies, prothrombin time and activated partial prothrombin time. These latter two tests will identify a serious bleeding disorder. Young women suspected of having a bleeding disorder can have a von Willebrand panel drawn (e.g. factor VIII activity, von Willebrand factor antigen, ristocetin cofactor), as well as a Platelet Function Assay 100 (PFA-100) or an alternative platelet function test such as platelet aggregometry. The interpretation of these tests can be complex, since the results can be affected by the stress of an acute bleed or the recent use of NSAIDs. Referral of the patient to a haematologist may be required for an accurate diagnosis.

A pregnancy test (quantitative β-hCG) and urine test to detect chlamydia and/or gonorrhoea should also be considered for all young women. A screen for thyroid disease can be performed by measuring levels of thyroid stimulating hormone. In women who have signs or symptoms of increased androgens levels and irregular cycles, further evaluation for PCOS or late onset congenital adrenal hyperplasia (by measuring 17-hydroxy-progesterone level) can also be performed (see the flowchart on this page).

Management

Management of the young patient with heavy bleeding should be carried out in the context of recognising the extent and severity of the blood loss. For some young women with severe blood loss, admission to hospital, intravenous fluids, blood transfusion and fresh frozen plasma may be required. However, many adolescents simply require reassurance that their menses are normal; sometimes iron supplementation will be necessary. Surgical management with a hysteroscopy, dilatation and curettage is very rarely required. The nonacute and acute management of a

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teenager with heavy menses is outlined below (also see Tables 3 and 4).

Nonacute management

Nonsteroidal medications

Nonsteroidal medications (e.g. ibuprofen, naproxen and mefanamic acid [Ponstan]) have been shown to reduce menstrual loss by an average of 30%.[8] This treatment also has the advantage of relieving dysmenorrhoea. Therapy should be started on the first day of menstruation and taken regularly until cessation of menses or for five days. However, to treat dysmenorrhoea effectively, therapy should begin prior to the onset of pain, if feasible.

Antifibrinolytic medications

Antifibrinolytic medications such as tranexamic acid (Cyklokapron; 1 g four times daily on days of heavy bleeding) have been shown to reduce menstrual loss by 50%.[9] There have been concerns regarding thrombotic complications with antifibrinolytic medications, but studies have shown no increased risk of thrombosis.[9,10] This therapy can readily be used both as an ongoing medication with each heavy period as well as in acute situations (see below). It can also be combined with the use of the cyclic combined oral contraceptive pill (OCP).

Hormonal therapies

In the nonacute setting, the combined OCP has been shown to reduce menstrual loss by 43%.[11] The monophasic OCP can also be used continuously to help decrease blood loss. This option has become more common over the last few years and improvement in menorrhagia has been shown, particularly in women with heavy menstrual loss.[12] A common regimen is to use the combined OCP continuously for three to four months and then have a withdrawal bleed. However, there are no studies that demonstrate the superiority of any regimen over another and the choice often becomes one of personal preference for the patient.

Some physicians and parents may express concern regarding the impact of the OCP on the patient's height. By the time a young woman has had her first period, she has already achieved 95% of her final height.[13] On average, she will grow another 3 to 5 cm after menarche. No studies have demonstrated that the OCP has any impact on final height in adolescent girls. Although some studies have shown a small reduction in final height in constitutionally tall girls treated with ethinyloestradiol, the doses used in these studies were five to 25 times higher than the doses found in currently used OCPs.[14]

In patients with nonacute bleeding who have contraindications to the OCP or who prefer to avoid using it, oral progestins

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Table 3. Nonacute management of heavy menses in teenagers

Drug	Dosage	Benefits	Adverse effects	Further comments
NSAIDs				
Ibuprofen	Up to 400 mg every four hours; max 1200 mg/day	Reduces blood loss by up to 30%. Reduces dysmenorrhoea. Used only during bleeding	Nausea, dyspepsia, diarrhoea, dizziness	–
Naproxen	500 mg x 1, then 250 mg every six hours; max 1250 mg/day	Reduces blood loss by up to 30%. Reduces dysmenorrhoea. Used only during bleeding	Nausea, dyspepsia, diarrhoea, dizziness	–
Mefenamic acid (Ponstan)	Up to 500 mg three times daily	Reduces blood loss by up to 30%. Reduces dysmenorrhoea. Used only during bleeding	Nausea, dyspepsia, abdominal pain, dizziness	Capsules may be opened and contents placed in a small amount of liquid
Antifibrinolytic agents				
Tranexamic acid (Cycklokapron)	Up to 1 g four times daily	Reduces blood loss by up to 50%	Nausea, vomiting, diarrhoea, giddiness	No thromboembolic risk
Combined oral contraceptive pill				
Combined oral contraceptive pill	Cyclic or continuous	Reduces blood loss by 43%. Provides contraception	Nausea, irregular bleeding, headaches, thromboembolism	–
Oral progestins*				
Norethisterone acetate (Primolut N)	10 mg daily for 12 to 14 days monthly	Useful for patients with contraindications to oestrogen	Nausea, vomiting, abdominal pain, fatigue, drowsiness	Does not provide contraception
Medroxyprogesterone acetate (Medroxyhexal, Provera, Ralovera)	10 mg daily for 12 to 14 days monthly	Useful for patients with contraindications to oestrogen	Nausea, appetite changes, mood changes	Does not provide contraception
Parenteral and implantable progestins				
Medroxyprogesterone acetate (Depo-Provera, Depo-Ralovera)	150 mg intramuscularly every three months	Provides contraception	Breakthrough bleeding, weight gain, bone mineral density loss, prolonged return to fertility	Ensure adequate calcium and vitamin D intake
Etonogestrel (Implanon Implant)	One implant every three years	Provides contraception	Irregular bleeding pattern, weight gain	–

* For patients with suspected anovulation.

(medroxyprogesterone acetate [Medroxyhexal, Provera, Ralovera] 10 mg daily for 12 to 14 days or noresthisterone [Primolut N] 10 mg daily for 12 to 14 days) can be taken on a monthly basis. This applies to patients with anovulation or PCOS to induce withdrawal bleeding and prevent build-up of the endometrium under the influence of unopposed oestrogen. Injectable progestin (Medroxyprogesterone acetate [Depo-Provera, Depo-Ralovera]) or implantable progestins etonogestrel [Implanon Implant]) are also options for adolescents with heavy menses (all used off label).

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Levonorgestrel intrauterine device

The use of the levonorgestrel intrauterine device (Mirena) for menorrhagia has been well studied and has shown reductions in menstrual loss of up to 96% in adult women. This option has been used in adolescents and could be considered for young women with contraindications to other treatment options. In these circumstances, referral of the patient to a gynaecologist is warranted.

Severe acute bleeding

In cases of severe acute bleeding, hormonal therapy is most commonly used to help decrease flow within 24 to 36 hours (Table 4). There is no agreement on the most appropriate regimen. Oral progestins can be used acutely in young women with suspected anovulation. Norethisterone 10 mg three times a day can be used until bleeding has decreased significantly. It should then be continued twice a day for several weeks before allowing a withdrawal bleed (the actual length of treatment will depend on the patient's haemoglobin levels).

The combined OCP can also be used acutely; the use of a 30 or 35 μg pill twice daily should help decrease bleeding within a few days. Once bleeding has decreased, the pill can then be used once daily until haemoglobin levels allow a withdrawal bleed. Patients taking high doses of oestrogen often require antiemetics to tolerate them. Antifibrinolytic agents can also be used during heavy bleeding as described above. If neither of these regimens is successful, referral of the patient to a gynaecologist is warranted.

Management of young women with bleeding disorders

Specific treatment for young women with bleeding disorders is appropriate. In an acute first presentation, results regarding platelet function and factor deficiencies will not be immediately available and treatment will need to be commenced without these results. If there is a high suspicion of

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Table 4. Acute management of heavy menses in teenagers

Drug	Dosage	Further comments
Oral progestin		
Noresthisterone acetate (Primolut N)	10 mg three times daily until bleeding has decreased; then 10 mg twice daily for several weeks until patient can tolerate a withdrawal bleed	Withdrawal bleed will occur upon discontinuation or abrupt changes in dosage
Combined oral contraceptive pill		
30 or 35 µg, monophasic	One tablet twice daily until bleeding has settled, then one tablet daily until patient can tolerate a withdrawal bleed	Patient may require antiemetic agents

a bleeding disorder based on a family history and previous significant bleeding associated with operative procedures or with epistaxes, it would be wise to avoid nonsteroidal medications. Desmopressin acetate (1-deamino-8-D-arginine vasopressin; DDAVP) in the form of a nasal spray (Minirin Nasal Spray) has an established role in the management of patients with type 1 von Willebrand disease and mild to moderate haemophilia A (used off label). It is a vasopressin analogue that works by increasing plasma levels of von Willebrand factor and factor VIII.[15]

Conclusion

Careful assessment of the adolescent with heavy menstrual loss is essential. Anovulation is the most common cause and has the advantage for many of being a problem that will reduce as maturation of the hypothalamic pituitary ovarian axis occurs. In contrast, recognition of an underlying bleeding disorder is important because there are some specific treatments, and education towards longer-term options will be needed. Pelvic pathology is very uncommon in these adolescents. MT

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COMPETING INTERESTS: None.

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