

Excessive Vaginal Bleeding in Adolescence

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Abstract

Gynaecological emergencies of adolescents are peculiar to particular period & can pose difficulties in diagnosis & management. It is clinically challenging for gynaecologists to manage adolescent with profuse bleeding per vaginum. Genital examination in this age group requires sensitive approach & gentleness to preserve their psychosexual health & future fertility potential, various etiological causes are explored with emphasis on anovulatory bleeding, coagulopathy, trauma, sexual abuse, tumours.

Keywords: Adolescent; Per vaginum bleeding; Coagulopathy; Trauma; Tumour.

Introduction

Adolescents constitute about 1/5th of the total population of India. The health of this important segment of population has been neglected until recently. Children & adolescents have always suffered, though not frequently, from genital tract problems. Gynaecological emergencies of young ones are peculiar to a particular period & can pose difficulties in diagnosis & management. Hence, the gynaecologist must address the issue adequately & endeavour earnestly to protect the health of our female children & teenagers.

Adolescent gynaecology is a subspecialised area of gynaecology. The problems encountered are often unique to this age group. Medical & surgical management of this patient requires particular expertise.

Gynaecological care of adolescents is

multidisciplinary approach involving gynaecologist, endocrinologist, oncologist, psychologists. Genital exam in adolescent age group requires a sensitive approach with forethought & gentleness to preserve their psychosexual health & future fertility potential.

In this article we discuss the various clinical challenges, the gynaecologist faces while treating adolescent patient with excessive bleeding per vaginum. We explore various clinical conditions as etiological factors. We specially emphasize on anovulatory bleeding, coagulopathy, trauma, sexual abuse, tumours. Platelet function disorders are discussed in detail.

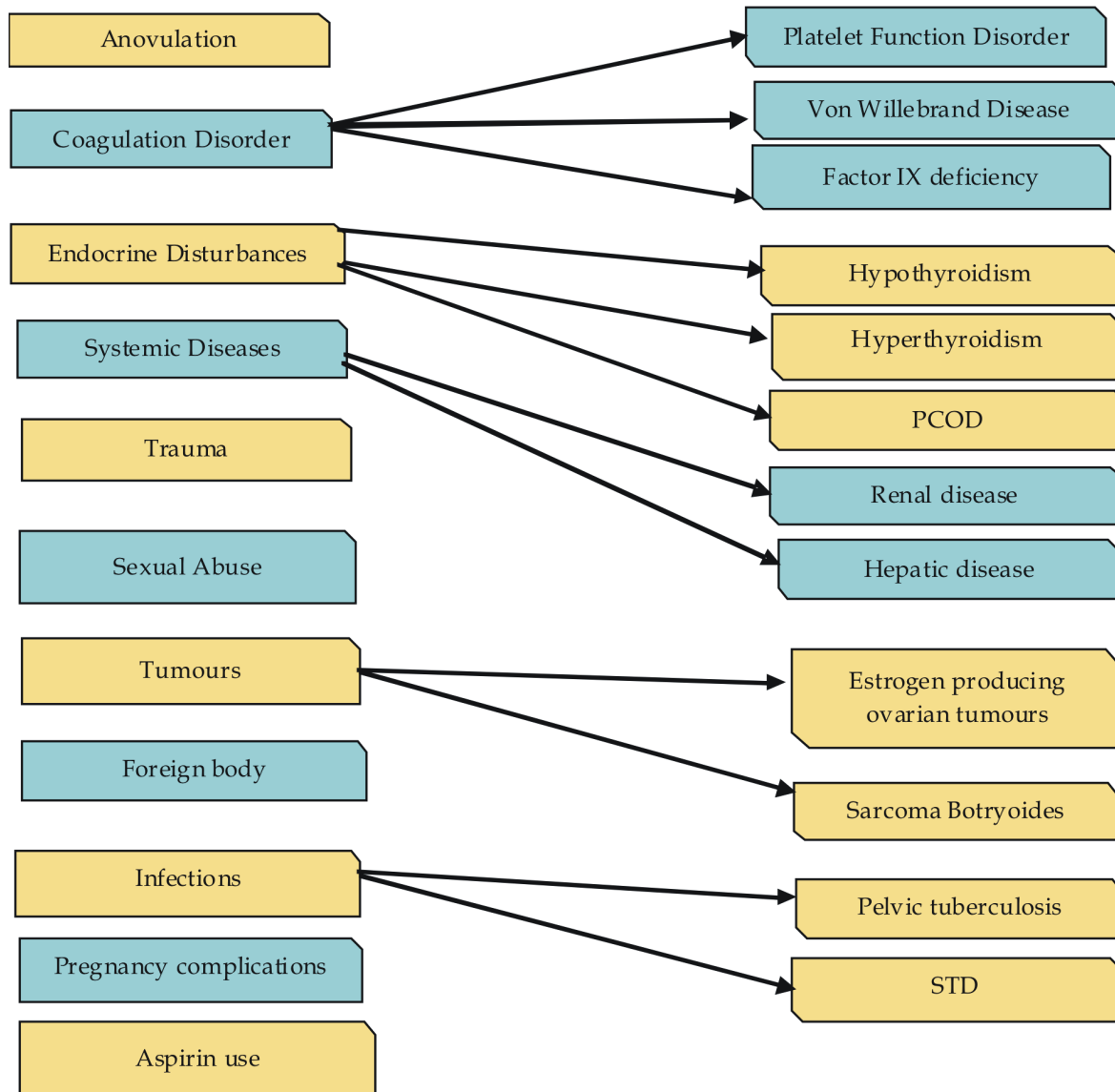
Heavy Menstrual Bleeding

Heavy menstrual bleeding (HMB) is a common problem in adolescent girls where it comprises a significant public health problem. HMB affects almost 1/3rd of adolescent girls at the time of the menarche. Reports from multiple studies indicate that between 5-10% of young girls in this age group will seek medical treatment & of those, approximately 1/2 will experience surgical intervention. Indeed HMB has been reported to negatively impact several quality of life parameters. Often these girls will miss school, sports & other social

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Table 1: Aetiology of Excessive Vaginal Bleeding in Adolescence

activities because of associated symptoms & there are psychosocial factors that deserve consideration. Hygiene issues are important factors, particularly in developmentally delayed adolescents.

Excessive vaginal bleeding is frightening for young girls & parents as well as especially for the mother.[1]

Faced with a mother and her daughter giving a story of heavy menstrual loss, it is important that the clinician take an accurate history from the child if possible.[2]

Clinical Approach

On examination, one needs to know if the general health of the girl is good.

- Are there signs of anaemia?
- Is there any suggestion of a general disorder contributing to the problem?
- Is there any abdominal swelling?
- What does the vulva look like?
- Does the hymen look normal & intact?
- Is there any abnormality on rectal

examination?

- If bleeding is in progress, how heavy does it appear?
- What is the blood picture?[3]

Puberty menorrhagia is a doubly challenging clinical problem; for the physician has to accurately assess the severity of the problem, treat as necessary without interfering too much with natural mechanism and reassure the frightened child and mother.[4]

Occasionally this bleeding may continue for several weeks. Once again, the problem of anovulation is the likely cause. Immaturity of Hypothalamo Pituitary Ovarian axis is the cause of heavy menstrual bleeding in approximately 75% of cases in young females. However, HPO axis is the diagnosis by exclusion. As ovulation has not occurred, the endometrium continues to be stimulated by unopposed estrogen, when menstruation eventually occurs the bleeding tends to be excessive & prolonged. This can be recurrent problem until the cycle becomes irregular, occasionally anaemia results with Hb as low as 6 or 7gm/dl.[5] First 30-40cycles after menarche may be anovulatory, with the unopposed estrogen action & endometrial hyperplasia.[6]

Management of Abnormal Bleeding

Hormonal

Bleeding may be controlled by prescribing:

- Oestrogen alone
- Progesterone alone
- Or both concurrently or consecutively

Oestrogen alone are not recommended because of the endometrial proliferation they cause & heavy loss that is apt to occur when that are stopped.

Combine O.C. containing 30µg oestrogen with progesterone should be given as:

- One Tab TDS: until bleeding stops
- One Tab per day continued for 2 weeks
- Stopped to allow the patient to have a withdrawal period.

A further course of combined O.C. can be prescribed using a 30µg oestrogen/progesterone combination. Such treatment should be undertaken only for 3 months.[3]

In rare situations in which hormonal therapy is contraindicated or bleeding is excessive and uncontrollable, the use of GnRh analogues have been recommended, not only to decrease menstruation, but to produce amenorrhoea.[7]

Hospitalization

Indications for hospitalizations:

- History & exam not consistent with symptoms
- Failure of treatment
- Recurrence after treatment
- Severe anaemia
- Shock

In the presence of clinical signs of hypovolemia, admission to hospital is required with aggressive efforts to control the bleeding medically or surgically. Blood transfusion is indicated only if Hb is low. IV oestrogen [25mg 4hourly] can be given if the patient is unable to tolerate oral therapy & progesterone therapy is added later. After achieving haemostasis & abnormal Hb, the patient goes on cycled therapy for 2-3 months. Patient who have underlying coagulation defect may require long term hormonal treatment. Progesterone only preparations such as Norethisterone is planned as it does not interfere with endometrial histology following curettage. Danazole is usually not given in adolescence.[8]

Surgical Treatment

D&C (not responding to hormones): Dilation and curettage is not the first line of therapy in anovulatory irregular bleeding in the adolescent and is rarely necessary except in the patients with known bleeding diathesis. In such patients, bleeding should be controlled immediately using D&C, after which appropriate medical therapy should begin. If

bleeding persists, the physician should suspect an anatomic abnormality not identified during the D&C. Further diagnostic evaluation (e.g. Hysteroscopy) should be considered.[7]

Curettage has a very small part to play in the management of adolescent menorrhagia. Dilation & curettage may be indicated in the patient once the medical treatment is not clearly successful. Tuberculosis is one condition which may be found in association with adolescent menorrhagia. Endometrial overstimulation with oestrogen unopposed by progesterone can cause cystic glandular hyperplasia which is predisposing to endometrial cancer. It is here that serious risk of adolescent menorrhagia lies. Anovular bleeding persisting over several years should be taken seriously.[3]

Organic disease which rarely cause adolescent menorrhagia are:

- General
- Coagulation defect
 - √ Idiopathic Thrombocytopenic Purpura
 - √ Von Willebrand Disease
- Bleeding from genital trauma
- Foreign body in genital tract.
- Oestrogen producing tumours.
- Rarely arterio - venous malformations of vessels supplying the uterus.
- Pelvic Tuberculosis.
- Endocrine:
 - √ Diabetes mellitus.
 - √ Thyroid disease.
- Renal, hepatic disease.
- Abortion. (6)

Coagulation Defects

Coagulation is the most frequent course of adolescent menorrhagia after DUB, but are frequently underestimated because of physician concentrate on uterine cause of bleeding. In the study of Classens & Cowell (1981), a nine year review suggested 19% had a primary coagulation disorder.[3] Patients

may have thrombocytopenia, usually due to idiopathic thrombocytopenia purpura, rarely from other causes. Von willebrand's disease occurs in 1-2% of the population & is among the most common of the inherited causes of menorrhagia. Factor IX deficiency has been described as a cause of menorrhagia).[8] The second most common cause of excessive uterine bleeding in the adolescence is a coagulopathy.

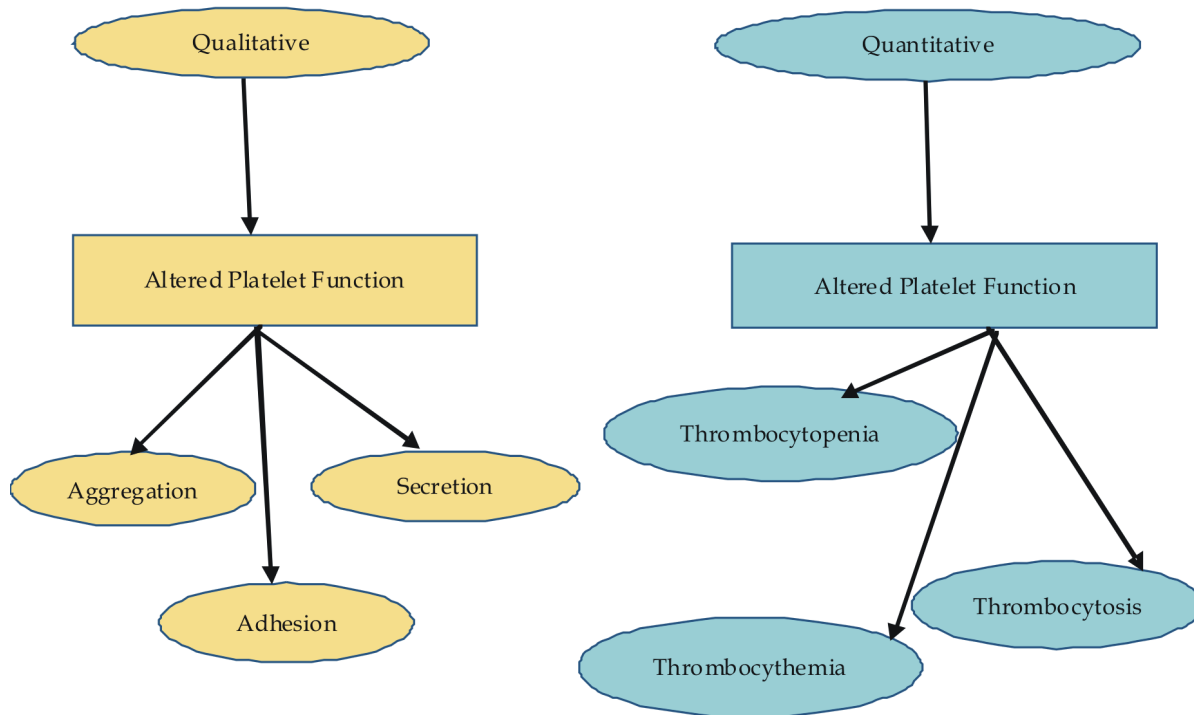
Evaluation of Patients with Suspected Coagulopathy:

- Blood Tests:
- Complete blood cell count
- Blood Smear
- Platelet Count
- Partial Thromboplastic Time
- Bleeding Time (7)

Coagulopathy

Platelet function disorders (PFD) receiving increasing attention as an important aetiology of heavy menstrual bleeding (HMB) in adolescents. An understanding of presentation profiles, diagnostic limitations & effective treatment regimens for these disorders are important for effective management of these disorders. The storage pool subtype is the most prevalent of the PFD in these patients. Standard platelet functions screening has a number of limitations in diagnosing many of the PDF subtypes & platelet aggregation studies & electron microscopy are important diagnostic adjuncts.

Adolescents with heavy menstrual bleeding should be carefully evaluated and the presentation profile is quite important when one is considering a platelet function disorder aetiology. Most young adolescents with inherited bleeding disorders, particularly those with VWD, PFDs and other coagulation factor deficiencies, clinically manifest HMB at the onset of the menarche. Menstruation represents a major haemostatic challenge and at menarche, pre-adolescent & teenage girls

Table 2: Platelet Function Disorders

with these disorders will often be seen in the emergency room with complaints of acute onset of heavy vaginal bleeding & significant anaemia with haematocrits in the 20% and haemoglobin levels, 4-5 mg/dL. Often fluid resuscitation including several blood transfusions is required to replace acute blood loss. To treat ongoing bleeding, it is often necessary to implement appropriate pharmacologic therapeutics. Indeed, HMB is often the only indication of an underlying endocrine or bleeding disorder.

Questioning should be directed towards:

- Discovery of common indicators of an underlying bleeding disorder such as easy bruising (i.e., bruises >5cm diameter occurring e" 1/month duration),
- Epistaxis that occurs e" 1/month duration
- Gingival or other mucosal bleeding as well as excessive bleeding associated with surgery, dental procedures and minor trauma.
- It is particularly important to obtain a family history of these same problems, and to ask about ancestors with heavy

menstrual bleeding.

A majority of adolescents with underlying bleeding diatheses have heavy menstrual bleeding within the first year of menarche and so is important to determine when the heavy bleeding was first noticed. Many patients will have relatives that had early hysterectomies because of long and/or heavy menstrual bleeding. Family histories of bleeding tendencies can also assist in identifying PFDs. The examining physician should look for signs of anaemia including tachycardia, pale skin and mucosa & decreased blood pressure, in addition to the presence of petechiae, ecchymosis and purpura. Trans-abdominal ultrasound of the pelvis to exclude any uterine abnormalities as well as presence of foreign bodies can replace an internal pelvic examination, particularly in non-sexually active teens. Obtaining a complete blood count with platelet counts along with assessment of platelet size and morphology is traditionally the first approach, and will aid the clinician in excluding any associated syndromes. Preliminary screening studies are aimed at detecting coagulopathies. Both PT and a PTT

are considered a standard part of initial testing.

Indeed, quantitative platelet defects are ruled out in the presence of normal platelet counts. Results of the platelet testing can be influenced by interfering drugs, including SSRI's, tricyclic antidepressants, prostaglandin inhibitors, and some antibiotics. Most laboratories recommend discontinuing any of these medications for at least 7-10 days prior to testing. Options for treating PFDs will depend on the severity of the bleeding.

Recommended modalities, include:

- Hormonal
- Non-hormonal
- Combined approaches.

Acute vaginal bleeding with significant blood loss requires empirical treatment started immediately, before the patient's laboratory tests are available for interpretation. One approach is to follow treatment regimens designed for patients with VWD and HMB. The treatment modality contains high doses of estrogen. It is important to draw blood for VWF assays, other coagulation testing and platelet function studies prior to initiating any therapy as treatment protocols can be modified after factor deficiency and platelet function study results are obtained.

The use of high dose estrogens is advocated. The exact mechanism through which high dose estrogens promote haemostasis is not completely understood. It is thought that elevated circulating estrogens increase clotting factors and stimulate platelet aggregation that in turn assists in achieving haemostasis. One regime involves IV estrogens such as Premarin® given in doses of 25 mg every 4-6 hours. When the bleeding stops, an oral form of estrogen combined with progestin is administered. Combined estrogen and progestin are often given in the form of a combined first generation oral contraceptive pill. Another strategy is to begin with combined oral contraception pills (OCPs) in place of IV estrogen, and this is particularly useful in patients who do not have nausea and vomiting. First generation OCPs such as

Ovral® (50 µg ethinylestradiol and 0.5 mg of norgestrel) are particularly appropriate, and they are administered as a single tablet every 4-6 hours. The dose is incrementally decreased when the bleeding stops, and this is usually ~24 hours after commencing treatment.

In some cases non-hormonal therapy can be combined with the high dose estrogen regimen to control the initial bleeding. In addition, an anti-emetic such as Ondansetron should be considered to control nausea associated with high doses of estrogen. Giving the patient a first generation OCP every eight hours for two days and then every 12 hours for three days and finally one OCP a day. The patient may be continued on that regimen for a number of months skipping the hormone free OCPs so as to avoid menstrual flow. If the patient is well controlled on this regimen, a second or third generation OCP can be substituted and the patient allowed menstruating by continuing with the hormone free interval pills. Some patients with PFDs will have intra-menstrual bleeding on the lower dose OCPs and will need to continue to continue on a higher dose birth control pill.

Patients presenting with only moderate bleeding without anaemia can be effectively treated with second or third generation low dose OCPs such as Desogen®. In most cases the patient should be started on once-a-day dosing. These regimens are preferable as they lack the side effects associated with the higher dose first generation OCPs.

Intrauterine Devices (IUD)

The progestin-containing intrauterine device, Minera® is an accepted strategy for controlling excessive menstrual bleeding in teens with PFDs. The IUD contains a comparatively strong progestin that contributes to endometrial atrophy and reduces menstrual flow. However, adolescents with a history of STDs should be carefully scrutinized and followed appropriately. The copper T IUD is associated with increased menstrual flow and is not recommended for treating heavy menstrual periods.

Non-hormonal

®(1-diamino-8-D-arginine vasopressin or Stimate®). DDAVP works by releasing von Willebrand antigen and Factor VIII from platelets and endothelial cells. It also increases the expression of glycoprotein 1b/IX and CD62 (P-selectin) on platelet cell surfaces, which lead to increased platelet activation and adhesion. One treatment regimen that is used with acute blood loss is to infuse 0.3 µg/kg desmopressin (DDAVP®) in 30 ml of saline over 30 minute duration. Another regimen used for stable patients is to give DDAVP (Stimate®) in the form of a nasal spray with one squirt (150 µg) per nostril in patients that weigh less than 50 kg, and one squirt to both nostrils for those weighing 50 kg or more.

Platelet Transfusion

Platelet transfusion is considered a therapy of last resort and is done in consultation with a paediatric haematologist. It is usually administered in patients with documented platelet dysfunction and significant uterine bleeding refractory to other therapeutic approaches. A recent study reports on the generation of functional megakaryocytes and platelets derived from human endometrial stem cells.[9]

Diagnosis of dysfunctional uterine bleeding should be used only when all other organic and structural causes of abnormal vaginal bleeding have been ruled out. Appropriate and early management of the patient is necessary in order to minimize the possibility of future complications regarding woman's reproductive ability.[10]

Following conditions can interfere with the processes:

- Congenital adrenal Hyperplasia
- Cushing's syndrome
- Hepatic dysfunction
- Adrenal insufficiency
- Thyroid dysfunction
- Thyroid abnormalities and liver dysfunction can reduce the metabolic

clearance rate of oestrogen.[7]

Trauma

Lacerations of the vulva or perineum may be caused by falling on a sharp object. The labia majora are the most common sites of injury. The wound is usually relatively trivial, but bleeding may be profuse if the laceration has penetrated deep to the labia. The bleeding should be controlled with direct pressure, the patient should be resuscitated as necessary, and referral should be made for exploration and repair under general anaesthesia if there is suspicion of deep penetration or the wound is of significant size or depth.

Blunt trauma, for example from falling astride a climbing frame, may result in vulval or perineal haematoma. The scale of the bleeding should be carefully assessed; pelvic x-ray should be taken if the history merits it. Ice can be applied locally and analgesia should be given as a routine. Pressure dressing should be applied. If the haematoma is large or increasing in size the child should be admitted for operative drainage and haemostasis.

Vaginal lacerations or haematoma may also result from accidental injury or from foreign body insertion by the child, but a particularly high suspicion of abuse must be maintained. If there is hymenal laceration, vaginal examination is mandatory. Retroperitoneal bleeding from torn pelvic vessels may accompany vaginal trauma.

Referral should be made to the gynaecology and paediatric teams for:

- Assessment
- Repair of lacerations
- Evacuation of haematoma
- Treatment of any associated injury under anaesthesia
- The integrity of urethra, bladder and bowel should be checked under the same anaesthesia

If the vaginal vault is lacerated, exploration of the pelvic cavity is indicated.[11]

Sexual Abuse

All health care providers need to be aware of the signs and symptoms of sexual abuse. To assess for sexual abuse, the examiner must be aware of the multitude of normal hymenal variants and those hymenal lesions consistent with penetration, as well as other factors that suggest abuse. As a general rule, hymenal irregularities, notches and scarring in the lower half of the hymen plus or minus scarring in the posterior fourchette are suspicious of penetration. If there are concerns about abuse based on history, child behaviour or physical examination, a referral to child protective agencies should be made. Urethral prolapse (circumferential eversion of the urethral mucosa) usually presents with painless vaginal bleeding; occasionally dysuria and frequency, and on rare occasions, urinary retention.[12]

Foreign Body

A foreign body within the vagina can present with vaginal bleeding as one of the symptoms along with a profuse, foul smelling vaginal discharge plus or minus vulvitis. A small ball of toilet paper is the most common offender and can often be removed in the office using topical anaesthesia and vaginal irrigation with an 8 mm or 10 mm paediatric catheter and warm saline. Otherwise, an EUA will be needed to remove the foreign body.[12]

Tumours

Although uncommon, genital tumours must be considered whenever a girl is found to have

- A chronic genital ulcer
- An atraumatic swelling of the external genitalia
- Tissue protruding from the vagina
- Foul-smelling bloody discharge (7)

Because of progress in tumour markers, diagnostic imaging techniques, chemotherapy regimens & surgical techniques, the prompt & precise detection of either benign or malignant tumours can lead to both cure & preservation of fertility with conservative

surgery whenever possible.

The common benign tumours of child & adolescent include haemangioma, simple cysts of the hymen, benign granulomas of the perineum & condyloma acuminata. Haemangioma is best left alone. Treatment is reserved for lesions that fail to regress or developed complications such as bleeding or ulceration.

Although malignant tumours arising from vulva of this age group is a very rare, sarcoma botryoides (rhabdomyosarcoma) & endodermal sinus tumours have been reported. The clear cell adenocarcinoma often associated with a history of antenatal exposure to diethylstilbestrol. The age of the DES-exposed patients have varied from 7-34 years with the highest frequency from 14-22 years. The onset of sarcoma botryoides from the uterine cervix is very rare with a peak incidence in the second decade.

Sarcoma botryoids has a typical "grape like" appearance due to a layer of spindle cells pushing up beneath the mucosa in polypoid masses. Occasionally the only symptom the patients may present with is unexplained vaginal bleeding or abdominopelvic mass. Approximately 65% of cases are diagnosed in children less than six years of age with remaining cases noted in the 10 to 18-year-old age group.[13]

The management of rhabdomyosarcoma has progressed from radical surgery to neoadjuvant chemotherapy followed by surgery or radiotherapy. Initial treatment should be with combination chemotherapy, usually vincristine, actinomycin-D & cyclophosphamide. Further surgical excision or radiation therapy may be necessary after the course of chemotherapy. For the clear cell adenocarcinoma, radical surgery was the management of choice. Adjuvant radiation or chemotherapy may be necessary in some cases. In recent years, neoadjuvant chemotherapy for reduced tumour size followed by surgery & radical abdominal trachelectomy for retained fertility has been reported.

Only a few cases of endometrial cancer have been reported in adolescent. Uterine sarcomas account for less than 4% of all malignancies of the uterine corpus. Endometrial stromal sarcomas (ESS), mixed mesodermal tumour (MMT) & leiomyosarcoma (LMS) are the 3 major histologic types. Uterine LMS tends to occur in younger women than does MMT. LMS of the uterus in a girl has been reported, as is its sudden presentation as a pelvic mass. [14]

A young girl with a hormone producing ovarian tumour will present with, either precocious puberty, abnormal vaginal bleeding or symptoms or signs of virilisation and hirsutism. Ovarian tumours in the adolescent girls pose a special challenge since the need for preservation of gonadal tissues and reproductive function has to be balanced against the need for complete excision of the tumour. [15]

Germ cell tumours develop frequently throughout early childhood to adolescence. Ultrasonography is more specific in the diagnosis of follicular cyst than a corpus lutein cyst. However large cysts may rupture & cause peritonitis. It may require operative intervention to control bleeding.

Ovarian cancers, specific to child & adolescent patients include germ cell & juvenile granulosa cell tumours. Ovarian cancer is an insidious disease. Because of non-specific symptoms ovarian cancers are frequently diagnosed in advanced stage. The surgical approach to germ cell or stromal ovarian cancer confined to a single ovary should aim to preserve fertility & ovarian function. Advanced disease is not usually accompanied by contralateral ovarian disease, conservative surgery by retaining the uterus & contralateral ovary should be preferred. [14]

Infections

Genital TB may cause excessive menstrual bleeding in the beginning of the disease process. [1] Pregnancy complications-adolescent may be unaware of the missed periods in pregnancy & can develop bleeding

due to its complication. [8]

Endocrine Disturbances

Hypothyroidism or PCOS can manifest as menorrhagia. Endocrine disorders such as thyroid abnormalities should be considered as both hyper-and hypothyroid conditions can be associated with abnormal uterine bleeding and can be corrected. In general, thyroid disorders can be excluded by obtaining TSH levels. [8]

Discussion

Adolescents want to feel that they are in control, and that their health care provider is non-judgmental and will maintain confidentiality at all cost. In addition, adolescents need to hear that their care is confidential; however, there are some instances where confidentiality cannot be guaranteed, such as suspected abuse. Parental involvement should always be discussed and encouraged. Communication skills are paramount to a therapeutic relationship with any patient but especially with the adolescent. The health care provider should avoid patronization and be able to freely discuss sexuality without judgment.

Trauma leading to genital manifestations including sexual abuse can have grave consequences affecting reproductive potential of young ones & their psychology. Neoplasms in young age pose a diagnostic & therapeutic dilemma. The challenges of gynaecology in children & adolescents are the complexity of physical & mental health, so the approach needs delicate skill & reasoning. Because they are not in full adulthood but in the transitional stage, the multidisciplinary & meticulous approach & management is a substantial issue. Balance & flexibility are the main key of this medical care. Extreme over treatment or ignorance & carelessness leading to under quality care are challenges facing the doctor.

Coagulopathy-in adolescent patients presenting with profuse per vaginal bleeding,

coagulopathy should always be ruled out, platelet dysfunction disorders is major etiological factor in coagulopathy. To discuss all the conditions with coagulopathy is beyond the scope of this article.

Platelet

Consideration of future directions in treatments based on the studies discovery include using generated platelets derived from endometrial stromal stem cells for autologous source of platelet therapy, thus bypassing the usual limitations of transfusion therapy in these patients. Additional studies will be needed to define the feasibility of applying this modality. If successful will offer a novel approach to treating disorders.

Both young children and adolescents respond positively when allowed to have control over the tempo of the interview and the examination. A positive experience associated with a genital examination will help to open lines of trust. This along with non-judgmental, open communication, will create educational opportunities to enhance a responsible transition from child to young adult.

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