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Original Article

A Study To Evaluate The Aetiological Factors And Management of Puberty Menorrhagia

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Abstract:
Introduction: This study aims to evaluate the incidence, clinical presentation, etiological factors and treatment outcomes of the patients suffering from puberty menorrhagia.
Methods: 65 patients with puberty menorrhagia attending the outpatient as well as indoor department of NRS Medical College, Kolkata during the period from February, 2005 to July,2006 were included in the study. They were prospectively analysed to assess the aetiological factors and the outcome of treatment required to manage these cases.
Results – The incidence of puberty menorrhagia was 9.6% in our study. 40%s patients had menarche between 12-13 years. 61.6% had anovulatory dysfunctional uterine bleeding(DUB). 15.4% had hematological causes. Hypothyroidism, endometrial tuberculosis, polycystic ovarian disease were other important causes. 40% were relieved with tranexamic acid, 26% required hormone treatment and 35.3% received blood transfusion.
Conclusion: Anovulatory DUB is the cause of menorrhagia in most of the cases .Medical treatment is mostly effective while surgical procedures are limited to few specific cases.
Key Words: Puberty menoorhagia, Anovulation, Hematological disease, Polycystic ovarian disease

Introduction:

Puberty is defined as the period during which secondary sex characters begin to develop and the capability of sexual reproduction is attained. Puberty menorrhagia is defined as excessive bleeding in amount (>80ml) or in duration(>7days) between menarche and 19 years of age.[1] Menarche is one of the most important events in life of adolescent girl. Although mechanisms triggering puberty and menarche remain uncertain, they are dependent on genetics, nutrition, body weight and maturation of the hypothalamic pituitary- ovarian (HPO) axis. The complete maturation of the axis may take up to 2 years.[1]

Almost a quarter of population in developing countries comprises girls below 20 years.[2] In India, children under 15 years of age constitute about 40% of population.[3] Menstrual disorders affect 75% of adolescent females and are a leading reason for visit to physicians.[4] During this period, it is common for adolescents to present with complaints of menstrual irregularities Postmenarcheal cycles are initially anovulatory. Without ovulation estrogen effect is unopposed by endogenous progesterone resulting in endometrial proliferation, with eventual excessive menstrual bleeding. Thus in a developing country, like India , puberty menorrhagia is a fairly common gynecological disorder in adolescence and sometimes it invites life threatening event. This study was conducted to find out incidence, causes of pubertal menorrhagia, its complication and role of conservative therapy.

Methods:

A total of 65 young girls from the age of menarche to 19years with history of excessive bleeding per vagina attending outdoor patient department or admitted in the indoor department of Obstetrics and Gynecology, Nilratan Sircar Medical College and Hospital, Kolkata were included for the study.Blood loss during menstruation was considered excessive if (i) the girl had persistence of menstruation of more than seven days or/and (ii) if there was history of passage of clots and the girl had pallor and hemoglobin 10 gm% or less. The study was carried out from 1st February, 2005 to 31st July 2006. A detailed history regarding age, socioeconomic status, birth incidents, milestones of her growth, pubertal developments, onset of thelarche, pubic and axillary hair development, growth pattern, and menarche was noted. The presenting complaint with onset, duration and amount of blood loss were noted in details. Enquiries were made about menstrual interval, duration of bleeding, passage of clots, number of pads required daily. The medical history included history of recent weight gain or loss, any voice changes, tuberculosis, endocrine disease like diabetes, thyroid disorder, any cardiac, renal and hematological disorders. Past surgical history was explored for any complication especially for any excessive bleeding .Personal history included history of any drug intake specific for any disease or which had bone marrow toxicity. Sexual behavior, any history of trauma or abortions were also noted. Family history was taken in details regarding presence of any disease like tuberculosis, diabetes, thyroid disorders, bleeding diathesis.

The physical examination included calculation of height, weight and BMI of the individual. Pallor, icterus, signs of malnutrition for any vitamin deficiency was noted. Neck vein, neck glands, gum bleeding along with pulse, blood pressure and temperature were noted. Abdominal palpation was done to find hepatosplenomegaly, ascites and any other abdomino- pelvic mass in the lower abdomen. Skin was noted for any purpuric spots. Tenderness in sternum and other bony areas were seen along with presence of any joint swelling. Obese patients were examined for any signs of acne, hirsutism and features of hyperandrogenism. Secondary sex characters, like breast development, axillary and pubic hairs were inspected. Gynecological examination included inspection of the vulva and if the hymen appeared intact, vaginal examination was avoided; instead, a bimanual rectal examination was done to palpate the pelvic mass for these young girls. Speculum and per vaginal examination was done for those patients who were married.

A protocol for investigations to be carried out was made. Some of the investigations were done routinely in all patients which include a) estimation of hemoglobin, total and differential count, platelet count and peripheral blood smear examination b)bleeding time, clotting time, prothombin time, activated partial prothombin time, platelet aggregation study c) endrocrine evaluation like estimation of blood sugar, thyroid hormone status, luteinising hormone, follicular stimulating hormone, fasting insulin and prolactin d) ultrasonography of abdomen and pelvis(e) Serial folliculometry to assess ovulation status Some of the investigations were done in selected patients which include a) chest X-ray, mantoux test was done in suspected cases of tuberculosis b) menstrual blood for DNA PCR examination of Mycobacterium tubercular antigen and endometrial study was done in a few selected cases c) bone marrow examination, serum ferritin and hemoglobin electrophoresis having hematological problem d) Examination under anaesthesia and laparoscopy for diagnosis of any pelvic masses.

The management protocol was followed on the basis of early diagnosis of the underlying causes. Menstrual calendar was maintained in all patients. Clinical assessment was done to assess the amount of blood loss or whether the patient is in shock or having hypovolemia. Prostaglandin synthetase inhibitors like Mefenamic acid, antifibrinolytic drugs like Tranexamic acid were used as a first line of drugs during the days of menstruation for control of blood loss. Hormones like oral contraceptive pills, progestins were prescribed in cases not responding to nonhormonal therapy. Anaemia was corrected by oral haematinics or blood transfusion in consultation with haematologist. Specific treatment for correction of haematological disease, thyroid disease, tuberculosis, surgery for organic disease were carried out. Importance was given to provide full nutritional, physical and psychological support to the young girls.

The periodic follow up of these patients were done by maintaining menstrual calendar, clinical examination and by monitoring therapeutic response.

Results:

Total 65 patients with puberty menorrhagia were analyzed for the study. Amongst them 41(61.5%) were treated in the outpatient department. The rest 25 (38.4%) needed admission due to severe bleeding. Thity one patients(31/65 ;47.7%) with menorrhagia were between 11 to 13 years of age, close to the age of menarche. Sixty nine percent (69.2%) patients belonged to low middle class with the monthly family income of Rs.500 to Rs.3000. Thirty (30/65; 46.15%) patients in this study had BMI less than 20 whereas seven (7/65; 10.8%) had BMI more than 25.

Table 1: Age at menarche

Age of Patients	No. of patients	Percentage
<10 yrs	1	1.54
10 -11 yrs	2	3.08
11 -12 yrs	13	20.00
12-13 yrs	26	40 .00
>13 yrs	23	35.38
Total	65	100

The age of menarche is shown in Table I. Twenty six (40%) of these patients had menarche between 12-13 years and 23(35.4%) of them started menstruation after 13 years. The majority of them (62/65; 95.4%) had development of stage IV Tanner secondary sex characters. 37(37/65; 56.9%) patients had menorrhagia of less than 6 months of duration and 15(15/65; 23.1%) were suffering for more than 1year. Twenty-nine (29/65;44.6%) patients had hemoglobin level of 10gm/dl or less (Table 2).

Table 2: Hemoglobin percentage of the patients

Hemoglobin%	No. of patients	Percentage
<5 gm/dl	3	4.63
5-7 gm/dl	11	16.92
7- 10 gm/dl	15	23.07
>10 gm/dl	36	55.38
Total	65	100

The aetiological factors are shown in Table III. Out of the 10 haematological cases 6(6/10; 60%) were ITP cases and rest one each (10%) were hypoplastic anaemia, Bernard Soulier disease and congenital afibrinogenemia and Von Willebrand disease . Forty (40/65;61.5%) patients had anovulatory dysfunctional bleeding which was diagnosed by serial folliculometry on ultrasonography(Table IV). The patients whose age of menarche was less than 13years developed ovulatory cycles earlier (57.69%) than patients whose age of menarche was greater than 13 years(35.71%).

Table 3: Etiological factors of puberty menorrhagia

Aetiological factors	No. of patients	Percentage
Anovulation	40	61.58
Hypothyroidism	6	9.23
Hematological cause	10	15.38
Pregnancy related complications	3	4.61
Fibroid uterus	2	3.07
Polycystic ovarian disease	2	3.07
Tuberculosis	1	1.53
Drugs (warfarin)	1	1.53
Total	**65**	**100**

Table 4: Anovulatory menstrual cycles in puberty menorrhagia

No. of patients with age at menarche	Anovulation corrected		Anovulation uncorrected	
	No. of cases	Percentage	No. of cases	Percentage
<13 years (n=26)	15	57.69	11	42.31
>13 years(n=14)	5	35.71	9	64.29

Table 5: Management of Puberty Menorrhagia

Type of management	Number of patients	Percentage
Only Iron	3	4.61
Iron+ Tranexamic acid	26	40
Iron+Progesterone	12	18.47
Iron+ Oral pills	5	7.69
Specific(Antikoch's -1& Thyroxine-6, ITP-6, Bernerdsoulier's disease-1, Afibrinogene-mia-1)*	15	23.07
Surgical	6	9.23

* Alongwith specific treatment these patients were also treated with progesterone and tranexamic acids.

Management of patient with puberty menorrhagia is shown in Table V. Twenty six (26/65;40%) of these patients responded well to iron and 3-5 days course of Tranexamic acid in the dose of 1-2gm daily. Twelve (12/65;18.4%) patients responded with oral progesterone for 6-12cycles and 5(7.6%) showed good response with oral contraceptives. All 6 hypothyroid patients were treated with L-thyroxine. There were 6 ITP patients who were treated with prednisolone with excellent response. Out of them one patient had under gone splenectomy, two patients received platelet transfusion .Four patients received oral medroxyprogesterone from day 5 to day 25 of cycle for three cycles. Iron supplementation was given in all patients .In one patient steroid was stopped and her platelet count remained normal. Rest of the patients were on oral prednisolone therapy.

Dilatation and curettage was done in 4(4/65; 6.15%) cases for disturbed pregnancy, tuberculosis and intractable menorhagia. Specific surgical procedure like polypectomy and myomectomy were required in 2(2/65; 3.1%) patients. Blood component transfusion was given in 23(23/65; 35.4%) patients.

Discussion:

Adolescence is the span of human growth extending from immaturity of childhood to the physical and psychological maturity of adulthood. Mehotra[5] in their series found 10% of their adolescent patients suffering from menorrhagia. The present study shows an incidence of puberty menorrhagia as 9.6% among 624 adolescents during the study period.

The average age of menarche is 12.5 years in India.[6] In this study 40% of patients had menarche between 12 and 13 years and 35.5% had menarche after 13 years.

Rao[1] found that majority of the patients of puberty menorrhagia belonged to lower socio economic group .This study also revealed 55% of our patients belonged to rural family and 69.2% came from lower socio economic group. Osler[7] argued that the critical body weight must be 47.8 kg for menarche .The study shows that 46.6% of patients were between 40 and 50 kg of weight and 95.4% suffering from menorrhagia had tanners stage 4 of breast and pubic hair development. Rao[1] reported the requirement of blood component transfusion to be 37% in treating cases of puberty menorrhagia.[1] In our study the requirement of blood transfusion was 35%.

In the present study 56.9% of patients had duration of the disease for less than six months and 15% developed menorrhagia at menarche. Rao[1] also observed 62% of their patients had these menstrual disorders of less than 6months duration.[1]

In adolescents 95% of cases of anovulation are due to the immaturity of HPO axis.[8] These adolescents lack the positive feedback mechanism necessary to initiate an LH surge and subsequent ovulation despite normal follicular estrogen level. Chaudhuri et al,[9] found 71% of their patients suffered from dysfunctional uterine bleeding. In our study 61.5% of the patients had documented anovulation .

Royal College Of Obstetrician and Gynaecologist,1999 [10] recommended tranexamic acid and mefenamic acid as first line drugs for women with menorrhagia who either do not require contraception or prefer non hormonal treatment. 26 patients (40%) in this study group responded well with use of tranexamic and mefenamic acid during menstruation along with oral iron therapy.

Progesterone can be used cyclically in two different treatment Protocols – as short course during luteal phase and a relatively longer course lasting 21 days from day 5 of cycle. In the present study 12(18.4%) patients received oral progesterone therapy. Norethisterone was used from day 5 to day 25 of cycle for 3 cycles. It rapidly increased the hemoglobin level and decreased the menorrhagia. In the present study 5(7.6%) patients responded with oral Contraceptive pills. Tranexamic acid was used with triphasic oral pills in 17.1% of cases and with progestogens in 8.5% cases.[1]

The second most common cause of abnormal bleeding in adolescents is coagulation disorders. Claessens and Cowell,1981 [11] in a 9 year review, examined all admissions at a children's hospital for acute menorrhagia and determined that 19% were the result of primary coagulation disorder. The present study shows hematological disorders to be present in 15.3 % of cases. Thrombocytopenia which was noted in 9.2 % (6/ 65) of patients was found to be the commonest haemtological disease in our study (6/10). In both cases of hypofibrinogenemia and Bernard Soulier syndrome, the patients presented with menorrhagia since menarche. Congenital hypofibrinogenemia is an autosomal recessive disorder where clotting factor 1 is lacking and it results from consanguineous marriage. In our patient she had profuse menorrhagia which was controlled by fresh blood cell transfusion and cyclical progesterone.

In Bernard Soulier syndrome (BSS), studies of platelets reveal a quantitative and qualitative abnormality of the membrane GPIb / IX /V complex in platelets and macrophages. Menorrhagia is of early onset. Defects in three genes give rise to the typical clinical features and platelet anomalies associated with BSS. This is due to the multi-subunit nature of the affected GPIb/IX/V receptor. The main function of the GPIb/IX/V complex is to ensure normal primary hemostasis by initiating platelet adhesion at sites of vascular injury. Adhesion is brought by its binding to von Willebrand factor, itself captured from plasma by subendothelial collagen. Defects are due to mutations in GPIbA (20 mutations), which is the largest subunit and bears the von Willebrand binding site, in GPIbB (16 mutations) and in GP9 (11 mutations).[12] One patient in our series had Bernard Soulier variant type of disorder. On peripheral smear her platelets were large .Small amount of immunologically detectable GPIbIX protein was detected by flow cytometry. She was prescribed Oral iron supplementation, Tranexamic acid during menstruation. Subsequently oral progesterone was prescribed from day 5 to day 25 of menstruation to get relief of symptoms.

Hypothyroidism is associated with menorrhagia. It is probably due to estrogen break through bleeding secondary to anovulation. Defects in haemostasis has been demonstrated due to decreased levels of factor VII, VIII. IX and XI.[13]

In the present study 6 patients (9.2%) were found to be hypothyroid. They responded to thyroid supplementation.

Polycystic ovarian syndrome(PCOS) is an association of hyperandrogenism and chronic anovulation in women without any specific disease of adrenal or pituitary and is one of the most common endocrine disorder. Overall, 60-85% of patients with PCOS demonstrate overt menstrual dysfunction primarily oligomenorrhoea although 5% may demonstrate polymenorrhoea.[14] Chronic anovulation leads to endometrial hyperplasia due to chronic estrogenic stimulation. Rao[1]found 2.8 % of the cause of puberty menorrhagia were due to polycystic ovarian disease.[1] The present study shows that 3.07%(2/65) of puberty menorrhagia was due to polycystic ovarian disease. Diagnosis was confirmed with altered day 2 LH & FSH ratio, features of hyperandrogenism and USG diagnosed polycystic ovaries. Both of them were prescribed OCP for 3 months. The cycle regularized and menstrual bleeding became normal.

The possibility of pregnancy complications like miscarriage must be excluded as a cause of abnormal uterine bleeding in adolescents.[15] The present study shows pregnancy related complications in 4.6 % of patients. Although rare, uterine pathology, such as polyps and fibroids, may lead to abnormal bleeding.[15] The present study shows two patients(3.1%,) had uterine fibroid.

Rao, 2004 found that genital tuberculosis in 5.7 % of patients in patients of puberty menorrhagia[1].In the present study only one patient was found to have endometrial tuberculosis(1.5%). Diagnosis was made by menstrual blood PCR study for tubercular antigen. It was positive. She was treated with antitubercular drugs along with tranexamic acid during menstruation.

Use of certain medications such as hormonal treatment like depomedroxyprogesterone acetate, non steroidal anti-inflammatory agents like aspirin, anticoagulants like heparin, coumarin, digitalis can cause irregular menstrual bleeding.[16] The present study shows only one patient on anticoagulants due to open heart surgery developed menorrhagia (1.5%) and menstrual cycle was restored with reduction of the dose of anticoagulant and use of concurrent tranexamic acid.

In the follow-up of these patients 43(66.2%) were cured with therapy and normal cycle was restored. Rest were controlled on continued treatment.

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