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Hematological abnormalities in adolescent menorrhagia

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Abstract *Background:* The purpose of this study is to determine the frequency of underlying hematological disorders as the cause of acute adolescent menorrhagia. *Methods:* The records of 25 patients that were hospitalized with acute adolescent menorrhagia in the Obstetrics and Gynecology Department of Cerrahpaşa Medical School of İstanbul University between 1988 and 1995 were analyzed. *Results:* The mean age of the patients was 13.9 ± 1.6 (SD) years. A hematological abnormality that caused bleeding diathesis and acute menorrhagia was diagnosed in 7 of the 25 patients (28%). There were four cases of immune thrombocytopenic purpura, two cases of Von Willebrand disease and one case of acute promyelocytic leukemia. All seven patients with a coagulation disorder required blood transfusions and the mean hemoglobin level at presentation was 6.2 g/dl.

Keywords Hematology · Adolescents · Menorrhagia

Introduction

Abnormal uterine bleeding is the most common menstrual disorder in the adolescent period [6]. Menorrhagia (menstrual bleeding exceeding 80 mL) is generally treated in the outpatient setting. Acute menorrhagia may be due to anovulatory bleeding or to underlying organic disease [8].

The purpose of this study was to examine the frequency of the hematological disorders in adolescent menorrhagia.

Material and methods

The records of Obstetrics and Gynecology Department of Cerrahpaşa Medical School of İstanbul University between 1988 and 1995 were reviewed to identify the cases of adolescent menorrhagia. Twenty-five cases between the ages of 11 and 17 years with adolescent menorrhagia, requiring hospital admission were identified.

The age of the patient, the age of menarche, previous medical history, the hemoglobin level on admission to hospital, the record of blood transfusion, the duration of hospitalization and the results of the detailed hematological investigations were recorded.

In all patients, we examined the medical history as well as the results of general and pelvic examination, transabdominal pelvic ultrasonography and hematological evaluation including the blood count, differential leukocyte count, platelet count, bleeding time and coagulation time, prothrombin time (PT) and partial thromboplastin time (PTT) (PT and PTT were measured by the coagulation method). The normal ranges for the coagulation tests were as follows: Bleeding time (1–7 min), Coagulation time (5–10 min), PT (12 s), APTT (26–36 s). Hemophilia and von Willebrand's disease were diagnosed or excluded by measuring Factor VIII, IX and XI levels, Factor VIII activity (FVIII:C), von Willebrand factor antigen (vWF:Ag) and von Willebrand factor activity (vWF:Ac). For a diagnosis of von Willebrand's disease vWF:Ac had to be less than 50 IU/dL.

Further hematological investigations (bone marrow biopsy, the determination of the levels of the coagulation factors) were done when necessary.

Steroid hormone therapy (oral contraceptives, medroxyprogesterone, acetate, conjugated estrogens) was given and specific hematological therapy (corticosteroids, fresh or frozen plasma, and/or coagulation factor concentrates) was administered when necessary.

χ^2 test and Student's t-test were utilized for the statistical analysis.

Results

Between 1988 and 1995, 25 patients with adolescent menorrhagia were admitted to the hospital. All patients were within the first year of the menarche. In 7 cases a hematological disorder was diagnosed. The specific diagnoses were immune (idiopathic) thrombocytopenic purpura (ITP) (4 cases), Von Willebrand's disease (2 cases) and acute promyelocytic leukemia (one case) (Table 1).

Information about all cases is summarized in Table 2. Symptoms suggestive of a bleeding diathesis (echym-

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Table 1 Data of patients with a hematological disorder ($n=7$)

Case	Age [years]	Age of menarche [years]	Blood type	Hemoglobin level on admission [g/dL]	Platelet count on admission	Number blood packs transfused	Duration of hospitalization [d]	Diagnosis
1	11	10	ARh (-)	5.8	220.000	5	11	ITP ^a
2	14	14	ARh (+)	7	185.000	1	9	ITP
3	17	17	ORh(+)	5	223.000	3	5	ITP
4	13	13	BRh (+)	6.5	238.000	2	5	ITP
5	11	11	ORh (+)	7	229.000	3	10	VW ^b
6	12	12	ARh (+)	6	312.000	5	9	VW
7	14	14	ABRh (+)	6.2	285.000	3	20	AL ^c

^a Immune (idiopathic) thrombocytopenic purpura ^b VW Von Willebrand disease ^c AL Acute leukemia

Table 2 Clinical data of the patients with and without hematological disorder($n=25$)

Data	All patients X \pm SD	Patients without hematologic disorder X \pm SD	Patients with hematologic disorder X \pm SD	P
Number of the patients	25	18	7	NS
Age [year]	13.95 \pm 1.65	14.16 \pm 1.24	13.14 \pm 2.11	NS
Age of menarche [year]	13.32 \pm 1.46	13.33 \pm 0.97	13.0 \pm 2.30	NS
Hemoglobin level [g/dL]	6.59 \pm 0.91	7.26 \pm 1.52	6.21 \pm 0.70	NS
Transfusion (number of blood packs)	2.50 \pm 2.53	2.11 \pm 2.22	3.14 \pm 1.46	NS
Duration of hospitalization [d]	7.68 \pm 5.80	7.38 \pm 6.24	9.85 \pm 5.04	NS

NS Non significant

osis, epistaxis, gingival bleeding etc.) were present in 3 of the patients with hematological disorder. The hemoglobin levels on the admission to the hospital were lower in the patients with a hematological disorder (6.2 g/dL versus 7.3 g/dl) ($p=0.09$). All of the patients with a hematological disorder had a hemoglobin level lower than 7.0 g/dL on the admission to the hospital, as against 66.7% (12/18) in the hematologically normal group. All patients with a hematological disorder required blood transfusion but, the transfusion rate was 66.7% (12/18) in the hematologically normal group ($p=0.08$).

Discussion

Menorrhagia is defined as a blood loss over 80 ml during a period [5]. Severe menorrhagia occurs frequently in women with a bleeding diathesis [3, 7]. The average menstrual blood loss was 220 mL (66–570 mL) with using objective criteria in women with a bleeding diathesis [9]. During the adolescent period, the most frequent cause of menorrhagia is dysfunctional uterine bleeding due to anovulation [6]. Menorrhagia may also be caused by a bleeding diathesis [8]. Claesens and Cowell [1], found a bleeding diathesis to be the cause of menorrhagia in 19% of their cases collected over 9 years in a pediatric clinic, the main ones being ITP, Von Willebrand's disease, Glanzmann disease, Fanconi anemia and thalassemia major. We diagnosed a bleeding diathesis in approximately 7 out of 19 patients who required transfu-

sion and in nearly half of the cases that presented at the menarche (6/14, 43%). Falcone et al. [2] found hematological disease in 8.2% of 61 patients with adolescent menorrhagia collected over a 10 year period. In our series, the rate of hematological disorders was 28% in adolescent menorrhagia. Our higher rates might be ascribed to the low levels of hemoglobin in our patients: below 10 g/dL in all cases and below 7 g/dL in 76% (19/25). The lack of statistically significant difference in the incidence of menarchal menorrhagia between the hematologically normal and abnormal groups, and between those who were and were not transfused reflects the small numbers in our cases series.

The most common hematological disorder in the adolescent period is ITP [4]. The function of the platelets and the formation of fibrin plugs play a major role in homeostasis during the shedding phase of the endometrium. Menorrhagia generally occurs in thrombocytopenia, Von Willebrand disease and thrombopathia [7, 10]. Symptoms suggestive of a bleeding diathesis like echymoses, epistaxis and gingival bleeding should be investigated. We found such in 43% of our patients. In another series, a family history of bleeding diathesis was found in 75% of patients with a hematological disorder [4].

Our study shows that the possibility of an underlying hematological disorder in adolescent menorrhagia is high enough not to be ignored and so every patient with menarchal menorrhagia and a hemoglobin level below 10 g/dL should undergo a detailed hematological investigation.

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