Study of Menstrual Pattern and Prevalence of Anemia in Adolescent School Going Girls

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Abstract

Objective: Adolescence is the period of rapid growth, connecting childhood to reproductivity. Because of improper diet and increased demand, there is a deficiency of nutrients, most commonly iron reflecting as iron deficiency anemia. One more important milestone is onset of menses in adolescence, which further adds to anemia. The age of menarche, cycle length, duration of flow, association of dysmenorrhea and PMS varies in every girl. Our aim of study is to know the age of menarche, the cycle pattern, and association of menorrhagia with anemia and overall prevalence of anemia in adolescent age group. *Material and Method:* We conducted our study in various schools of Udaipur city. Girls from 7th to 10th standard were included in the study with an age group of 10 to 16 years. The girls were given proforma to fill and Hb estimation was done by Sahli's method. *Conclusion:* Mean age of menarche came out to be 13.5 years.

Introduction

Adolescence is a transition period of human growth from childhood to adulthood. Adolescence comprises a large part of world's population. 1.2 billion adolescents stand at the crossroads between childhood and the adult world. Around 243 million of them live in India. Adolescents are full of energy, still there are a lot of problems, which are being encountered in this period. There are general health problems like anemia, obesity, chronic illness, skin problems and psychological diseases like anxiety, depression, and anorexia to problems of social adjustments.

Puberty is a hallmark of period of adolescences. It has three stages i.e. thelarchae (10 – 11 years), pubarchae (11 – 12 years), menarche (13 – 14 years). First recognized change is accelerated growth. Brest budding is first to appear, followed by appearance of pubic and axillary hairs, followed by appearance of first menstrual period i.e. menarche.

Menstruation is defined as cyclical shedding of progestational endometrium accompanied by loss of blood, from menarche to menopause. The discharge of blood and endometrial tissue from the vagina is called menstrual period.

Menarche is one of the most significant milestone in a women's life. The mean age at menarche varies from population to population and is known to be a sensitive indicator of various characteristics of population including nutritional status, geographic location, environmental condition and magnitude of socio – economic inequality in a society. Studies suggested that now menarche tends to appear earlier in life as the sanitary, nutritional and economic condition of the society improved.

To begin with, menstrual cycles are irregular. It takes two years for the hypothalamopituitary axis to get mature. There may be irregularity in rhythm like amenorrhea, oligomenorrhea and poly menorrhea. There may be abnormality in amount of blood flow like menorrhagia,

oligomenorrhea, polyrmenorrhea and intermenstrual bleeding, etc. Cycle maybe associated with pain i.e. dysmenorrhea, which may be primary or secondary.

Premenstrual syndrome is also known as premenstrual tension is a symptom complex, recognized primarily by cyclic changes associated with ovulatory cycles. It occurs 7 – 14 days prior to menstruation and spontaneously resolves after menses. It is characterized by headache, dizziness, diarrhea, nausea, vomiting, anorexia, insomnia, anxiety, and depression. One or more symptoms may exist in one individual.

Among adolescents, girls constitute a more vulnerable group, particularly in developing countries. Where they suffer from gender discrimination and are traditionally married at an early age and exposed to greater risk of reproductive morbidity and mortality. Developmentally it is a crucial period and food and nutrient needs are proportionally higher during the growth spurt. Anemia is a worldwide problem, most commonly due to wide spread nutritional deficiency. Anemia remains a major public health concern in preschool children, adolescents and pregnant women in the developing countries. While many studies have examined these two at risk group, there is a paucity of data on anemia in adolescents living in developing countries in the complex ecological context of poverty, malnutrition and gender inequality.

Iron deficiency is the most common nutritional disorder which affects about 20% of the world population. Iron deficiency is a systemic condition, which also have many known hematological consequences: it impairs work capacity and depresses immune function. In various studies, higher incidence is noted in adolescent girls. In India incidence of adolescent anemia is 60 – 70% and is higher from lower socio-economic strata and whose parents are less educated.

Anemia may be due to increased blood loss during menstruation or increased demand of iron during this period of rapid growth.

Material and Methods

The study was conducted by organizing camps in various schools of Udaipur city. Study subjects were adolescent girls of 7th to 12th standards of age group 10 to 16 years. Girls were given questionnaire regarding particulars, nutrition and various aspects of menstruation and problems associated with it. The proformawas explained to them beforehand. The socio-economic status was accesed on the basis of

Kuppuswami's scale according to book of PSM by Park. The girls were asked about their dietary habit regarding no. of meals, snacks, milk and fruit intake. Total protein and caloric intake was assessed. A record of height and weight maintained and BMI calculated accordingly. The girls were asked about the age of start of menstruation, thorough history was taken regarding cycle length, duration of flow, associated dysmenorrhea and other symptoms of PMS. According to the questions asked,proformawas filled and side-by-side hemoglobin estimation was done. HB estimation was done by Sahli's method, which is based on the principle of converting blood into acid-haematin by addition of dilute HCl and subsequent calorimetric comparison with a suitable standard. Tip of finger was pricked under aseptic condition, blood was collected up to 0.2 ml in pipette and transferred to graduated hemoglobin meter tube and N/10 HCl mixed with it. The same is left undisturbed for next 10 minutes. The readings were taken by adding distilled water accordingly.

Result

Table 1 shows different age groups studied from 10 to 16 years. Maximum no. of girls belong to 13 and 14 years of age i.e. 48.5%. Mean age of participants is 13.39 years. Out of 400 cases, 346 attained menarche by the time study was conducted and only 54 were not menstruating at that time, as shown in Table 2. Out of total 346 cases, maximum girls attained menarche at 13 and 14 years of age. Mean age comes out to be 13.5 years, as shown in table no. 3. To start with the menarche, only 56.93 % were regular and 43.07% were irregular. At the end of two years only 22.84% remained irregular [4]. Maximum no. of cases showed their cycle length between 21 to 35 days, only 28 cases were of oligo menorrhea and 20.8% were having polymenorrhea as shown in Table 4. Maximum no. of cases have their duration of flow between 2 to 7 days, as shown in table no. 5. 83% were having average blood loss, 8.6% showed menorrhagia, as shown in Table 6. Dysmenorrhea was present in 275 cases. Out of this, 60% were having mild in intensity and 8% having severe dysmenorrhea. One or more symptoms of PMS was present in 81.8% of cases. Total 332 (83%) girls were found anemic based on Hb estimation. 43.25% were mildly anemic, 31.75% moderately anemic and only 8% were severely anemic as shown in Table 7. Mean Hb was 9.22 ± 1.25 g%. Out of 30 girls, having heavy blood loss (> 80 ml), only 2 were severely anemic and were moderately anemic, rest 13 were mildly anemic. Cycle length of >7 days was seen in 30 cases of anemia.

Table 1: Age group wise distribution of cases

Years	No.	Percentage
10	4	1%
11	40	10%
12	68	17%
13	87	21.7%
14	107	26.8%
15	58	14.5%
16	32	8%

Table 2: Menarche status of cases

Total no. of cases	Menarche attained	Menarche not attained
400	346	54
100%	86.5%	13.5%

Table 3: Distribution of cases according to age at menarche

Age in years	No. of cases	Percentage
10	2	0.1%
11	5	1.4%
12	66	19%
13	174	50.3%
14	94	21.2%
15	3	9.1%
16	2	0.6%

Table 4: Cycle length (in days)

Days	No. of cases	Percentage of total
< 21	72	20.8%
21 – 35	246	71%
> 35	28	8.1%

Table 5: Duration of blood flow

Days	No. of cases	Percentage
< 2	8	2%
2 – 7	308	89%
> 7	30	9%

Table 6: Blood loss during menstruation

Amount of flow	No. of cases	Percentage
Average	287	83%
Heavy	30	8.6%
Scanty	29	8.4%

Table 7: Prevalence of anemia

Status of anemia Hb (gm/dl)	No. of adolescent girls	Percentage
Mild (9 - 11)	173	43.25%
Moderate (7 - 9)	127	31.75%
Severe (< 7)	32	8%
Non anemic (> 11)	69	17%

Discussion

Van Hoff et al (1998) studied the relationship of the menstrual cycle pattern in 14 – 17 years old adolescent with gynecological age, BMI and historical parameters [1]. The survey was held in both urban and rural region. A total of 2480 adolescent girls participated in the study. Gynecological age was strongly associated with the prevalence of irregular menstrual cycle but only weakly with the prevalence of oligo menorrhea. Gynecological age, low BMI, chronic non-specific lung disease or allergic disease, or weight loss of >5kg were independently associated with irregular menstrual cycle. In our study the mean age of participants was 13.39 years with a range of 10 to 16 years. And the mean age of menarche comes out to be 13.5 years. And the mean age of menarche comes out to be 13.5 years. At the start of menarche, 43.07% were having irregular cycles, but within two years of menarche only 22.84% remained irregular.

The study done by Cakir M et al (2007) studied menstrual pattern and common menstrual disorder among university students in Turkey [2]. The mean age of subject at menarche was 12.8 ± 1.3 years. Prevalence of menstrual irregularity was 31.2%. The duration between two periods and menstruation flow were 27.2 ± 2.5 days and 5.8 ± 1.4 days. Where as in our study, mean cycle length was 26.8 ± 6.61 days and the mean duration of flow was 4.75 ± 1.09 days.

A clinical report on menstruation on girls and adolescents fall on using the menstrual cycle as a vital sign by American academy of pediatrics, committee on adolescents, American college of obstetrician and gynecologists reported that in normal menstrual cycle in young females, menarche at (median age) 12.43 years, mean cycle interval: 32.2 days in first gynecological year, menstrual flow length < 7 days. Zegeye DT (2009) conducted a study in North West Ethiopia [3]. The mean age of the study subjects was 16.9 ± 1 year. The average age at menarche was 15.8 ± 1 year. A cycle length of 21 to 35 days was observed in 70.3% of the girls. The mean duration of flow was 4 ± 1.3 days. The overall prevalence of dysmenorrhea was 72% and PMS was present in 75.4%. In our study, 79.5% reported presence of dysmenorrhea and 78% showed presence of PMS with one or more symptoms. In our study, 83% girls were anemic and out of this, 43.25% were mildly anemic, 31.75% were moderately anemic and 8% were severely anemic. Mean hemoglobin was 9.22 ± 1.2g%. Toteja GS (2006) studied prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. It was more than 60% among adolescent girls. Rawat et al (2001) studied socio-demographic correlates of anemia among adolescent girls in rural areas of district Meerut [5]. The proportion of mild, moderate and severe anemia was 55.2%, 40.8% and 4% respectively.

Conclusion

Mean age of menarche comes out to be 13.5 years with mean cycle length of 26.68 ± 6.61 days. Mean duration of blood flow was 4.75 ± 1.09 days with average blood loss in maximum cases. 43% cases were having irregular cycles in first year after menarche. PMS was present in 81% of cases with dysmenorrhea present in 75.9% cases as shown in Table 8. The overall prevalence of anemia was 83% and was higher than other studies as shown in Table 9. This may be because of different areas studied with different socio-economic status [6].

Table 8: Comparison of menstrual pattern in our study with other studies

S. No.	Parameter	Present study	Cakir et al (2007)	Zegeye
1	Mean age at menarche (in years)	13.5	12.8	14.8
2	Cycle irregularity (in first year after menarche)	43%	36%	42.8%
3	Mean cycle length (in days)	26.68 ± 6.61	27.7 ± 2.5	-
4	Mean duration of blood flow (in days)	4.75 ± 1.09	5.8 ± 1.4	4 ± 1.3
5	Blood loss in maximum cases	Average	Average	Average
6	Incidence of dysmenorrhea	79.5%	89.5%	72%
7	PMS	81.8%	-	75.4%

Tabel 9: Comparison of prevalence of anemia of our study with other studies.

S. No.	Parameter	Present study	Rawat et al (2001)	Toteja et al (2006)
1	Total anemic girls (%)	83%	34.5%	64.3%
A	Mild	43.25%	55.2%	-
B	Moderate	31.75%	40.8%	-
C	Severe	8%	2%	-
2	Mean Hb	9.22 ± 1.25 (g%)	10.1 ± 1.2 (g%)	-

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