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Age Of Menarche Determinants And Menstrual Problems In Adolescent Girls : A Cross-Sectional Study

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Abstract

Introduction : The onset of Menstruation is an important part of female maturation process and reproductive cycle. However, variability in age of menarche and menstrual cycles characteristics and menstrual disorders are common in adolescent girls.

Aims and objectives: The purpose of this study was to determine the age at menarche, menstrual problems of adolescent Girls and factors associated with it.

Methods: this is a cross-sectional descriptive study conducted on 300 school going adolescent girls, age 10-18 year, during Jan2016 to Dec2017. Who attained menarche and came in gynae OPD of Rajkiya Mahila Chikitsalaya, Ajmer(Rajasthan) were included. Data was collected by using self administered questionnaire on menstruation.

Results: Mean age of menarche was 13.09 ± 0.97 yrs. Girls from upper socio-economic class had significantly lower mean menarcheal age. Age of menarche was significantly higher in girls involved in physical/sports activity. Mean age of menarche in girls with excessive blood loss was higher. junk food consumption had significant relation with age of menarche and menstrual problems. Menstrual pattern was abnormal at the time of menarche in most of the girls. The most common menstrual problem was menorrhagia (74.7%), followed by Hypomenorrhoea (13.3%), and Oligomenorrhoea(3.7%). Dysmenorrhoea and premenstrual symptoms were perceived as most distressing symptoms leading to school absenteeism (10.66%.Most of the girls belonged to lower(53%) and middle socio-economic status(46%).mother remained the most important source of information(60.15%). 88.66%girls used sanitary pads during periods.

Conclusion: Study revealed that majority of adolescent girls had attained menarche at appropriate age. Most common menstrual problem were menorrhagia, dysmenorrhoea. They were influenced by certain modifiable factors.BMI, socio-economic status, sports activity. In rural India, where a female child and its problems are neglected, there is an urgent and unmet need to understand menstrual pattern and problems of adolescents and include it into the primary health care program.

Keywords: Age at menarche, Menstrual Pattern, Adolescent girls, menstrual Blood Loss, Sports Activities.

Introduction

Adolescence is a crucial periods of transition from childhood to adulthood. Maximum amount of physical, psychological and behavioural changes takes place in

these years. For girls, it is the periods of extreme stress and strain.

Adolescence is the period of life beginning with the appearance of secondary sexual characters and terminated with cessation of somatic growth. The five important physical changes are evident during puberty i.e. beginning of growth spurt, breast budding (thelarche), pubic and axillary hair growth (adrenarche), peak growth in height and onset of menses (menarche).

Adolescents in India constitute around 21.4% of the total population1. Attainment of menarche is considered as an important mile stone of adolescence period, which assures normal physical, endocrinal and physiological development. In the general population, menarche or onset of menstruation usually occurs between 11 and 14 years of age . Overall, after 15 years of age, majority of girls have usually attained their menarche.

The age of menarche varies in different parts of the world; many factors influence the age of menarche which includes, socioeconomic status, nutritional status of girls, genetic and environmental factors . Age of menarche has largely decreased in most developed countries in recent decades and seems stabilized at 13 -+ 0.5 years. Good nutrition, good socioeconomic status and freedom from disease had declines the age of menarche among different population, In India reported mean age of menarche shows a range of 12 to 14.8 years. Slight variation in the age of menarche may occur according to the nutritional status, hereditary pattern and climate difference.

Therefore this present study is aimed to study the pattern of menstruation & determinants of age of menarche in adolescent girls.

ACOG committee opinion

Box 1. Normal Menstrual Cycles in Adolescent Girls ⇦

Menarche (median age):	12.43 years
Mean cycle interval:	32.2 days in first gynecologic year
Menstrual cycle interval:	Typically 21–45 days
Menstrual flow length:	7 days or less
Menstrual product use:	Three to six pads or tampons per day

ACOG committee opinion

The menstrual cycle is often irregular during first few years after menarche due to anovulatory cycle. By the age of 17-18 years, menstrual cycle usually become regular. Menstrual disorders are common complaints in the adolescent before normal menstrual patterns are established.

These disorders includes

- Premenstrual syndrome
- Dysmenorrhoea,
- Menorrhagia,
- Oligomenorrhoea
- Polymenorrhoea
- Hyphomenorrhoea

The present prospective observational study was planned with the following objectives.

Objectives:

1. To study the prevalence of various menstrual problems in adolescent girls.
2. To study the menstrual pattern in adolescent age group.
3. To study the age and menstrual pattern at menarche.
4. To know about the adolescent's perception,feelings regarding menstruation and taboos associated with it, and to counsel them for appropriate treatment.

5. To create awareness about the reproductive health of the adolescent girls.

Material & Methods

A prospective study was conducted with 300 adolescent girls, age ranging from 10 to 18 years, during Jan 2016 to Dec 2017. The subject were Cases from gynae OPD, Rajkiya Mahila Chikitsalaya, Ajmer.

All cases were previously briefed regarding the aims and objective of the study.

Adolescent girls were evaluated for menstrual problems taking into account age, nutrition, education, socioeconomic status and family background.

Cases were interviewed and detailed questionnaire regarding their perception about menstruation and their practices during and related to menstruation. Detailed history regarding abnormal menstrual pattern, premenstrual complaints, dysmenorrhoea and any other symptoms related to menstruation.

They were also asked to indicate the materials they use as absorbent and the average number of days absent from school during menstruation. Their mother's level of knowledge about various aspects of menstruation was also noted.

Operational criteria used in this study were as follows:-

Menstrual flow

Accepted as per International Federation of gynecology and Obstetrics system for abnormal uterine bleeding was used which is as follows:-

Light <20 ml

Normal 20-80ml

Heavy >80ml

Frequency of Junk food

Frequent: ≥3days a week

Occasional: <3days a week

Adequate sports activities

Yes: >2hours/day for at least≥ 4days/week

No: <2 hours and/or <4days/week

Statistical Analysis

All the data was collected and compiled in MS Excel. The data was analyzed using percentages and proportion through tables.

Continuous variables were summarized as means and SD and were analyzed by using ANOVA test. Nominal /categorical variables were expressed as proportions and were analyzed using Chi Square Test. P value <0.05 was taken as significant.

Result

Present study was carried out on 300 eligible adolescent girls, age ranging from 10 to 18 years. Maximum eligible adolescent girls were in age group of 14-16 years followed by 17-18 years and <13 years. Mean age of adolescent girls was 15.49±1.41 years with the range of <13 to 18 years.

Mean BMI of eligible adolescent girls was 19.03 ± 3.86 kg/m2 with the range of <18.5 to ≥30 kg/m^2. Out of total, 51% participants were underweight, 40.33% were normal weight and 2% was obese.

Mean age at menarche was 13.09 ± 0.97 years with the range of 11 to 16 years in which most of the girls (90%) attained menarche at 12 to 14 years and only 0.33 % girls had menarche at 16 years of age. (Table – 1)

Mean duration of menstrual flow in present study was 6.80± 1.45 days and 71% participants had duration of menstrual flow between 7-8 days. (Table – 1)

In present study, 75% adolescent girls had normal amount of menstrual blood loss whereas 14% had scanty amount of blood loss and 11% had excessive bleeding. (Table – 1)

Out of total 300 girls, 270(90%) of the adolescent girls were menstruating at the interval of 26 to 30 days. Only 3.67% girls had menstrual cycle more than 35 days. None had menstrual cycle less than 21 days. Mean intermenstrual period was 29.79 ± 3.97 days. (Table – 1)

In this study 56.33% (169) girls out of total 300 had moderate degree of pain and they had to use oral analgesic to do their routine work. 26% (78) of girls had severe degree of pain and were unable to do their routine work. Only 17.67% (53) of girls had mild degree of pain. (Table – 1)

Table – 1

Variables of Menstruation pattern		Number	%
Age of Menarche (in yrs)	11	8	2.67
	12	80	26.67
	13	111	37
	14	79	26.33
	15	21	7
	16	1	0.33
Interval between two cycles(in days)	21-25	9	3
	26-30	270	90
	31-35	10	3.33
	>35	11	3.67
Duration of Menstrual Flow (in days)	2	1	0.3
	3	10	3.3
	4	26	8.7
	5	14	4.7
	6	36	12
	7	84	28
	8	129	43
Amount of Blood Loss	Scanty <10 ml	42	14
	Average 20-80 ml	225	75
	Excessive >80ml	33	11
Pain During Period	Mild	53	17.67
	Moderate	169	56.33
	Severe	78	26

Table – 2

Age of Menarche (in yrs)				
		Number	Mean Age of Menarche	P. value LS
Amount of Blood Loss	Scanty	42	12.78 ± 0.92	0.001(S)
	Average	225	13.07 ± 0.95	
	Excessive	33	13.60 ± 0.96	
Socio-economic Status	Lower	159	12.96 ± 0.92	0.010 (S)
	Middle	138	13.26 ± 0.99	
	Upper	3	12.33 ± 0.57	

Significant association was observed between the age at menarche and amount of menstrual blood loss in present study. This table shows that the mean age of menarche in girls with excessive blood loss was higher (13.6 years) as compared to those with average (13.07) and scantly blood loss (12.78 years). Application of ANOVA test revealed that this difference was statistically significant (P-0.001).

Present table depicts that mean age of menarche was lower in girls of upper SES (12.33 years) as compared to those in Middle (13.26 years) and lower SES (12.96 years). ANOVA test revealed that this difference was statistically significant (P<0.05). Significant association was observed between the socio-economic status and age of menarche (in yrs).

Graph showing Association of Socio-economic Status and Amount of Blood Loss with Age of Menarche

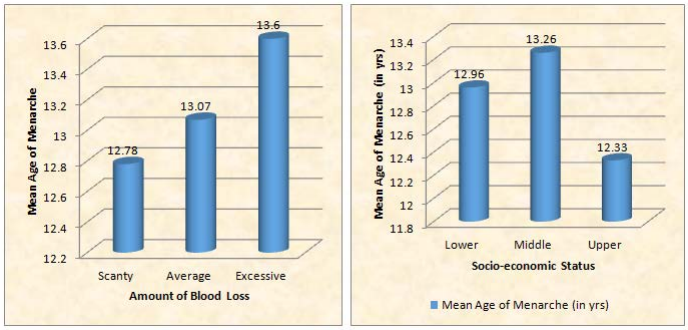

Table – 3 Association of age of menarche with Physical/ sports activity.

Age of Menarche (years)	Physical/sports Activity				Total	
	Yes		No			
	No.	%	No.	%	No.	%
11 years	6	75	2	25	8	100
12 years	46	57.5	34	42.5	80	100
13 years	90	81.1	21	18.9	111	100
14 years	62	78.5	17	21.5	79	100
15 years	15	71.4	6	28.6	21	100
16 years	1	100	0	0	1	100
Total	220	73.3	80	26.7	300	100

Chi-square = 15.147 with 5 degrees of freedom; P = 0.010 (S)

Above table depicts that higher physical activity was seen in those with age of menarche at 13 years (81.1%) and decrease in either side with lowest activity seen in those with menarche at 12 years. Chi square test showed that age of menarche as associated with physical activity (P<0.05).

Table – 4: Association of Intake of Junk Food with the age of Menarche

Age of Menarche (years)	Intake of Junk Food				Total	
	Frequent		Occasional			
	No.	%	No.	%	No.	%
11	7	87.5	1	12.5	8	100
12	35	43.7	45	56.3	80	100
13	38	34.2	73	65.8	111	100
14	24	30.4	55	69.6	79	100
15	3	14.3	18	85.7	21	100
16	0	0	1	100	1	100
Total	107	35.7	193	64.3	300	100

Chi-square = 17.445 with 5 degrees of freedom; P = 0.004 (S)

Present table reveals that younger age of menarche girls had more frequent intake of junk food (87.5% for 11 years) and decreases gradually with increasing age

of menarche. Chi square test showed that this decrease was statistically significant and that age of menarche was significantly associated with intake of junk food (P<0.05).

Table – 5

		No. of girls	Percentage
Hygiene practiced	Sanitary. Pads	266	88.66%
	Cloth pieces	10	3.33%
	Mixed	24	8%
Source of information	Sister	72	28.12
	Mother	154	60.15
	Friend	21	8.2
	Teacher	6	2.34
	Relatives	3	1.17

This present study shows that 3.33% girls preferred cloth pieces rather than sanitary pads as menstrual absorbent. 88.66% girls used sanitary pads during menstruation. Use of sanitary pads has become very popular. The more availability of sanitary pads now-a-days might be the reason for this finding. Poverty and to some extent ignorance might be an obstacle from using the menstrual absorbents available in the market. Some of the girls used sanitary pads for first two-three days and then switched over to cloth pieces.

In this study 85.33 % of girls aware of menstruation before menarche of them mother was the first informant in the case of 154 (60.15%) girls. Other sources of information were sisters (28.12%) / friends (8.20%), teacher 6(2.34%). Study done in Nagpur supported the present study's findings where mothers were the first informants for 71.33% of the girls.

Upper class girls had mothers who communicated more accepting messages about menstruation than did mothers from lower class families (Benjet & Hernandez- Guzman, 2002).

Table – 6: Distribution of adolescent girls according to menstrual disorders.

Menstrual disorders	No. of cases	Percentage
Menorrhagia	224	74.7
Oligomenorrhoea	11	3.7
Polymenorrhoea	0	0.0
Hypomenorrhoea	40	13.3
Normal	25	8.3
Total	300	100

The table shows different menstrual disorders identified during study in adolescent girls. On analysis of 300 cases of menstrual disorders menorrhagia in 224 (74.7%) hypomenorrhoea in 40(13.3%), oligomenorrhoea in 11(3.7%) cases. 8.3% cases came with the complaints of dysmenorrhoea and premenstrual symptoms.

Discussion

Adolescence is a period of transition from puberty to early adulthood. Transition phase involves major physical and emotional changes in the individual .In a traditional family setting in developing countries, mothers are usually the care takers of their daughters during these critical phase of physical and emotional development. In a conservative society and in rural population, the subject of menstruation and its hygiene is still considered a taboo subject for discussion. In the present study, it was observed that the mean age of menarche was 13.09 years. Chaturvedi *et al*, reported 13.7 years as the mean age of menarche, which is comparable to the findings of the present study. Patil M S and Durge PM have reported mean age at menarche as 13.45 and 13.5 years respectively. In the present study majority of adolescents (37%) had attained menarche at 13 years, 2.67% had menarche at 11 years and 0.33% girls had menarche at 16 years of age. Patil M S in her study reported that, 41.9% adolescent attained menarche at 11-13 years, whereas, 58.1% had attained menarche at 14-16 years. in the study of Supriya Kumari et al majority girls attained menarche at 12-13 years. The differences observed could be related to environmental, geographical and nutritional variations of study population.

Mean duration of menstrual flow in present study was 6.80± 1.45 days and 71% participants had duration of menstrual flow between 7-8 days. This finding is little bit dissimilar with the study of Gumanga et al in which mean duration of menstrual flow was 4-9 days and 71% had menses lasting for 2-5 days while 27.2% had menses lasting over 5 days.

Intermenstrual interval was 26-30 days in 90%, >35 days in3.67% in the present study. The study done by Prasad B.G et al observed that 74.5% of the adolescent girls were menstruating at the interval of 26 to 30 days. The mean intermenstrual period was 28.21 ± 1.58 days study done by Patil M S with 92.7% having intermenstrual interval 28-35 days and 6.8% having >35 days intermenstrual interval. the study of Rigon F et al who reported that out of total 4892 girls, majority had inter-menstrual period between 21 to35 days; 3.4% girls had more than 35 days of intermenstrual period and only3% girls had an inter-menstrual period less than 21 days.

In this study 56.33% girls had moderate degree of pain and they had to use oral analgesic to do their routine work. 26% of girls had severe degree of pain and were unable to do their routine work. Only 17.67% of girls had mild degree of pain. Similarly severe degree of pain was found in 30% of participants in the study conducted by Nirmala et al.

Present study revealed that 88.66% of girls were using sterile sanitary pads as absorbant, whereas 3.33% used old home cloth as absorbant. The major source of knowledge about menstruation and related problems was mothers in 60.15% of adolescents, friends in 8.20%, teachers (2.34%) or books (0.3%) in only few of them. This further signifies the role of educated mother for better understanding of menstruation and hygiene.

Conclusion

Attainment of menarche at right age is an important milestone during adolescence ,which signifies the normal functioning of the female reproductive system. Study revealed that majority of adolescent girls had attained menarche at appropriate age. Menorrhagia was the commonest problem among the adolescents. Mother was the commonest source of information for adolescents regarding knowledge about menstruation and hygiene. The use of hygienic sanitary pads as absorbant was prevalent in majority of adolescent girls. In rural areas, inhibitions still exists that prohibit adolescents from discussing their queries related to menstrual and problems with their parents, teachers or peers. There is strong need of education to adolescent population related to reproductive health. It will help in their development as healthy and responsible adults.

Recommendation

Menstrual problem should be dealt keeping in mind emotional and psychological aspects of adolescent age. Adolescent girls may feel shy and embarrassed to discuss aspects of menstruation like dysmenorrhoea consequently leading to ill health. Understanding friendliness, assurance and patience is needed when dealing with adolescent girls. Adolescent clinic should be established to address adolescent problems with respect, honesty and confidentiality along with social and psychological support.

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