

## Menarche, Menstrual Pattern and Related Gynecological Problems in Urban Adolescent Girls in Rajasthan

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### Abstract

*Introduction:* Adolescent girls live in a grey zone between childhood and adult female. Health issues of these girls have often been overlooked and gynecological problems are ignored as being part of growing up or as trivial symptoms. *Aims:* this study was undertaken to analyze and create awareness about the physiological and pathological conditions related to gynecology of adolescent girls. *Methodology:* A total of five hundred urban adolescent girls of age range (12-19 years) were included in this study. *Result:* Among the 500 urban girls although 98% were educated but only 40% knew about pubertal changes before they actually occurred. Mean menarche age noted was 13.45 years; ranged from 9-18 years; 93.4% attained menarche till the age of 15 years; and varied with socioeconomic status 12.1, 13.4, 14.2 years in high, middle and low socioeconomic groups. Most common gynecological problem was menstrual disorder seen in 60% of cases and among these 70% had menorrhagia, 19.3% oligohypomenorrhea and 9% had amenorrhea; 25 cases of menorrhagia required hospitalization due to severe anemia. Dysmenorrhea was prevalent in 56% of cases and 50% of these required analgesics for relief. Leucorrhoea and urinary problems were seen in 12.2% of cases. PCOD was diagnosed in 10 (2%) cases. There were 11 cases (2.2%) of

anomalies of genital tracts comprising of imperforate hymen (0.8%), transverse vaginal septum (0.8%), hypoplastic uterus (0.4%) and vaginal atresia (0.2%). Use of sanitary pads was seen in only 27.2% and taboos related to menstruation were seen in 80.4% of all cases. *Conclusion:* Magnitude of health problems in adolescent girls is large and this study reveals lack of knowledge about puberty and menstruation as well as various misconceptions among Indian adolescent girls. Clinicians and gynecologist should be aware of these problems and be able to prevent and treat them. Ensuring good adolescent reproductive health will ensure 'Safe Motherhood'.

**Keywords:** Adolescent; Menstruation; Menarche; Menorrhagia; Dysmenorrhea.

### Introduction

Adolescence is a wonderful period in human life during which a carefree child is being transformed into a responsible adult. The term adolescence comes from latin word meaning 'to grow to maturity'. Adolescence is a period when all the organs and systems of the body, mainly skeletal, muscular and endocrinal develop and there occurs marked acceleration in size and contour of the body [1].

Adolescent period extends from 10-19 years of age during which a girl develops her own personality and individuality [2].

Teenaged or adolescent girls make 10% of the population. Like the budding flower, the adolescent girl needs the nature of a caring environment at home, supported by a friendly, empathetic and sensitive health system to help her to bloom and mature into

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a healthy woman. An important milestone in adolescent girl life is attainment of menarche. It is important to educate adolescent girls and their caretakers about what to expect of a first menstrual period and the range for normal cycle length of subsequent menses.

Menstruation is the most dramatic manifestation of puberty. Being a phase of tremendous hormonal fluctuations, adolescent menstrual pattern invites more than a cursory attention. Our aim should be to give quality of life to young girls by improving their nutrition status including reproductive health, effective enforcement of marriage age at 18 years, counseling regarding pregnancy free adolescence and good antenatal care so as to prevent teenage maternal deaths. Once adolescent girls begin menstruating, educating for hygiene and asking her to chart her menses may be beneficial. Charting is important to identify an abnormal menstrual cycle. We are living in the era of smart phones and there are applications designed for this specific purpose.

The gynecological problems faced by these girls are far common yet they are not insignificant. Further these problems may not be recognized or the girls may not turn up to the gynecologist because of fear and embarrassment. These health problems may be related to growth, nutrition, development, psychology, sex or pregnancy. According to UNICEF 2011 report Indian has highest underweight prevalence, of 47%, among adolescent girls.<sup>3</sup>

Menstrual disturbances in adolescent girls are among the commonest presenting gynecological complaint all over the world [4]. Majority of these complaints are functional in nature and related to an immature feedback mechanism between ovary and hypothalamic pituitary axis [5]. This is influenced by stress, eating disorders, chronic disease, abnormal percentage of body fat and exercise [6].

At a stressful phase in life like that of adolescence, menarche & menstruation are found to elicit a tremendous psychological response in the girls. Also in a conservative society like ours, where these matters are hardly discussed freely and maturely there are bound to be some practices, customs and mores associated with these events. Added to this is the lack of knowledge and understanding as what is happening to their bodies at this time which leads to fear. Hence teenage girls with gynecological problems must be dealt with sensitivity. This will encourage them to come forward and express their anxieties and problems and ultimately protect their health.

The Federation of Obstetric and Gynaecological Societies of India (FOGSI) decided to highlight and

address the special needs of vulnerable, underprivileged and salient group of society and declared 1999 as "The year of the Adolescent Girl" with a goal to promote Education and Empowerment.

This theme has encouraged the author to undertake this study on adolescent girls, with the following objectives:

1. To study the prevalence of various gynecological problems in adolescent girls.
2. To study the menstrual pattern in adolescent age group.
3. To understand the adolescents' perceptions, feelings regarding menstruation and taboos associated with it, and to counsel them for appropriate treatment.
4. To create awareness about the reproductive health of the adolescent girls.
5. To study the physical and mental development of adolescent girls.

## Methodology

This was a prospective analytic study conducted on 500 adolescent girls, age ranging from 12 to 19 years. Among these one hundred cases were the patients visiting the gynae OPD, Rajkiya Mahila Chitkosalaya, Ajmer and rest 400 were school and college girls. All cases were briefed about the study and consent was taken. The cases were interviewed and preformed questionnaire was filled noting the demographics, perception about menstruation, menstrual pattern, practices during menstruation, premenstrual complaints, leucorrhoea, dysmenorrhoea or any other symptoms relating to diagnosis. Menstrual history was ascertained by questions regarding amount, length, frequency, use of pad or tampon. Mild pain during menses doesn't require investigation but severe pain causing disruption of daily activities and absence from school was thoroughly investigated. Personal history was taken by asking about smoking, alcohol, sexual activity, contraceptive use, level of education and socio-economic status. A history of urinary tract infection was inquired and investigated.

Hospital patients were thoroughly examined; general examination included height, weight, built, pallor, secondary sexual characteristics, abnormal hair distribution, lymphadenopathy, hernial sites followed by systemic examination was done. If needed local examination was done in relevant cases by gentle inspection of vulva, condition of hymen

and lower third of vagina and presence of discharge at the introitus. Routine investigations were done and specific investigations and USG were done in certain cases to ascertain the clinical diagnosis thereafter medical and surgical intervention was done.

### Results

This study included 500 adolescent girls between 12 to 19 years of age of urban population only (Table 1).

The majority of cases belonged to 15-17 years (63.8%) and middle socioeconomic group. The incidence of married girls in the cohort was 29 cases (5.8%). And among these 22 cases were married by the age of 18 years (Table 2-7).

**Table 1:** Age distribution of 500 adolescent girls

Age	No of Girls	Percentage (%)
12 years	18	3.6
13 years	42	8.4
14 years	73	14.6
15 years	87	17.4
16 years	138	27.6
17 years	94	18.8
18 years	39	7.8
19 years	9	1.8
Total	500	100

**Table 2:** Age and marital status of the cases

Age in years	Married	Unmarried	Total
12	-	18	18
13	-	42	42
14	-	73	73
15	-	87	87
16	7	131	138
17	5	89	94
18	10	29	39
19	7	2	9
Total	29	471	500

**Table 3:** Different gynecological problems encountered in this study

S. No.	Gynaecological problems	Number of girls	Percentage (%)
1.	Menstrual disorder	300	60
2.	Dysmenorrhoea	280	56
3.	Leg cramps	82	16.4
4.	Leucorrhoea	42	8.4
5.	Pelvic and abdominal pain	116	23.2
6.	Anaemia	25	5
7.	Urinary problems	19	3.8
8.	Secondary Amenorrhoea	18	3.6
9.	PCOD	10	2
10.	Primary Amenorrhoea	9	1.9

**Table 4:** Age of receiving first information regarding pubertal changes

Age of information	No. of girls	Percentage (%)
9	2	0.4
10	3	0.6
11	11	2.2
12	16	3.2
13	201	40.2
14	190	38
15	60	12
16	16	3.2
17	1	0.2
Total	500	100

**Table 5:** Reaction to first Periods

Reaction	No. of girls	Percentage (%)
Depression	200	40
Indifference	175	35
Revulsion	40	8
Pleasure	20	4
Nuisance	15	3

**Table 6:** Gynecological problems and level of education

Level of education	Total no. of girls	Girls with gynecological problems	
		N	%
Uneducated	12	10	88.3%
Middle	196	150	76.5%
Secondary	270	140	51.8%
College	22	10	45.4%
Total	500	310	62%

**Table 7:** Age of menarche and socioeconomic status

Age of menarche (years)	Socioeconomic status			Total cases attained menarche
	High	Middle	Low	
<10	3	3	-	6
11	11	18	-	29
12	15	71	-	86
13	24	120	4	148
14	1	94	5	100
15	-	72	17	89
16	-	10	13	23
>17	-	4	6	10
Mean age of menarche	12.1yrs	13.4yrs	14.2yrs	13.45yrs

In this study of majority attained menarche at the age of 13 years (29.6%); mean menarchal age was 13.45 years and age of menarche ranged from 9 years (1.2%) to 18 years (2%). Mean menarchal age was significantly lower (12.1 years) in girls with high socioeconomic status and better nutrition than in lower socioeconomic group (14.2 years) (Tables 8-16).

**Table 8:** Type of menstrual disorders

Menstrual disorders	No. of cases	Percentage
Menorrhagia	210	70
Hypomenorrhoea	38	12.6
Oligomenorrhoea	20	6.6
Polymenorrhoea	2	0.6
Metrorrhagia	3	1
Primary amenorrhoea	9	3
Secondary amenorrhoea	18	6

**Table 9:** Relation of oligohypomenorrhoea with age of menarche

Age of menarche in years	Total no of cases	No of cases with oligohypomenorrhoea
<10	6	-
11	29	-
12	86	2
13	148	6
14	100	10
15	98	19
16	23	20
>17	10	1
Total	500	58

**Table 10:** Etiological factors of amenorrhoea in study group

Etiological factor	No. of patients	Percentage (%)
P.C.O.D	10	2
Imperforate hymen	4	0.8
Transverse vaginal septum	4	0.8
Hypoplastic uterus	2	0.4
Vaginal atresia	1	0.2
Unknown	6	1.2

**Table 11:** Distribution of cases according to severity of dysmenorrhoea

Dysmenorrhoea	No. of cases	Percentage (%)
Mild	110	39.3
Moderate	142	50.7
Severe	28	10.0
Total	280	100.0

**Table 12:** Menstrual pattern in first 6 cycles and subsequent cycles

Menstrual pattern	First 6 cycles		Subsequent cycles	
	N	%	N	%
Regular	300	60	390	78
Irregular	200	42	70	14
Painful	270	55	375	75
Painless	220	45	125	25
Scanty	40	8	5	1
Normal	390	78	480	96
Excessive	70	14	10	2

**Table 13:** Mean length of first 6 cycles and subsequent cycles

Cycle length (days)	First 6 cycles		Subsequent cycles	
	N	%	N	%
<21	5	1	30	6
21-25	20	4	100	20
26-30	325	65	270	54
31-35	120	24	60	12
36-40	15	3	25	5
>40	15	3	15	3
Mean cycle length	29.11 days		25.93 days	

**Table 14:** Symptoms associated with menstruation

Symptoms	No of cases	%
Abdominal pain	116	23.2
Acne	70	14
Leg cramps	82	16.4
Backache	56	11.2
Irritability	15	3
Headache	8	1.6
Breast pain	5	1
Constipation	1	0.2
Nausea	1	0.2

**Table 15:** Hygiene practiced in menstruation

Material used	No of girls	%
Cloth pieces	355	71
Sanitary Pads	136	27.2
Both	22	4.4

**Table 16:** Taboos practiced

Taboos	N	%
Yes	402	80.4
No	98	19.6

## Discussion

In an adolescents' life the menarche is the culmination of physiological and anatomical changes during puberty. The age of menarche varies among individuals and is influenced by genetics, socioeconomic conditions, nutrition status, physical activity, family size and environmental influences [7,8].

This study included girls of urban background only, 63.8% belonged to 15-17 years of age, 80% were of middle socio-economic status and 98% were educated. In spite of this education and family status, only 40% adolescent girls had received information about pubertal changes before they actually occurred.

Majority of menstrual disorders are functional in nature and cycles are irregular during adolescence. Menstrual disorder was the commonest adolescent gynecological related problem (300 cases, 60%) noted in this study. Similar finding was reported by Archana [9] (74%). Menstrual disorders ranged from menorrhagia to amenorrhoea. Menorrhagia was the commonest menstrual disorder noted in 42% of cases. Twenty-five cases of menorrhagia required hospitalization due to severe anaemia of Hb level below 7% and required hospital treatment including blood transfusion, hemostatic and hormonal therapy.

It is common in adolescence to remain amenorrhic for more than 3 months therefore girls with duration of amenorrhea of more than 3 months should be investigated. Primary and secondary amenorrhoea was prevalent in 9 cases (1.8%) and 18 cases (3.6%), respectively. Most common cause of secondary amenorrhea was PCOD (2%). The PCOD cases presented with variety of symptoms amenorrhoea/ oligomenorrhoea/ obesity and or with hirsutism. On further investigation, USG was suggestive of PCOD. Imperforate hymen is the most common obstructive outflow anomaly in adolescent girls. On examination bluish bulging membrane and normal secondary sexual characteristics were the presenting features. During this study period we came across 4 cases (0.8%) of imperforate hymen and were treated with hormonal therapy and surgical intervention. A case of vaginal septum presented with dyspareunia of age 18 yrs, on per vaginal examination septum was detected and subsequently surgically excised. A single case of vaginal atresia presented with secondary sexual characteristics and USG revealed no uterus and fallopian tubes but ovaries present, vaginoplasty was done in this case. In present series oligohypomenorrhoea was seen in 58 (19.3%) cases of menstrual disorders (Table 8) and it was prevalent in those who attained menarche at a later age group (Table 9).

Dysmenorrhoea is derived from a greek word which means 'difficult menstrual flow'. It is characterized by suprapubic pain that begins between several hours before and a few hours after the onset of menstrual bleeding. It is frequently associated with nausea, vomiting, diarrhea and headache.

In this study dysmenorrhoea had high prevalence (280 cases, 56%) noted in adolescent girls, this is in concordance with Dambhare et al. [10] (56.15%); higher incidence was reported by Pitanguy et al. [4] (73%) on their study on Brazilian adolescent girls; Agarwal et al. [11] (83.2%) in Singapore, Gumanga et al. [12] (74.4%) in Ghana and Zegeye et al. (72%) in Ethiopia. Other Indian studies who reported higher incidence was Suresh et al. [13] (65.02%), Sharma et al. [14] (67.2%) but lower incidence of 33.5% by Nag [15].

Mild dysmenorrhoea rarely requires treatment and was seen in 22% of all cases; moderate-severe dysmenorrhoea was present in 34% of all adolescents. Kazama et al. [16] reported 46.8% incidence of moderate-severe dysmenorrhoea was but relatively higher incidence was reported by Agarwal et al. [11] (62%) and Banikarim et al. [17] (75%). Other symptoms associated with menstruation are shown in table 14 and abdominal

pain and leg cramps was the most common associated symptom seen in 23.2% and 16.4%, respectively.

A WHO study on menstrual pattern in adolescent girls states that immaturity of the hypothalamic-pituitary-ovarian axis during the early years after menarche often results in longer cycle duration; and 90% of cycles will be within the range of 21-45 days, although cycle period can vary beyond this range [18]. In concordance with this mean length of first 6 cycles were 29.11 days and 25.93 days in subsequent cycles. Cycles of <21 days occurred in 1% and >40 days in 3% during first 6 cycles. In subsequent cycles duration of <21 days was seen in 6% and >40 days in 3% of cases (Table 13). As seen in table 12, 42% adolescents had irregular cycles to begin with of which 28% reverted back to normal cycles within 6 cycles and in 14 % they persisted as irregular cycles. This might be attributed to hormonal fluctuations in peri-pubertal period and organic cause behind the same must be ruled out.

Because menarche is such an important milestone in physical development, clinicians should educate adolescent girls and their caretakers about what to expect of a first menstrual period and the range for normal cycle length of subsequent menses. In an American study by Chumlea et al. [19] states that 10% of US girls achieve menarche before 11 years, and 90% of all US girls by 13.75 years of age, with a median age of 12.43 years; also by the age of 15 years 98% will have had menarche. In our study 1.2% achieved menarche before 11 years, 93.4% till the age of 15 years and mean age of menarche in the cohort was 13.45 years. In our findings age of menarche varied with socioeconomic status and was lower (12.1 years) in high socioeconomic and more (14.2 years) in low socioeconomic group, similar statistically significant result was given by Dambhare et al. [10] ( $p < 0.05$ ). Studies have shown that age of menarche is between 12-13 years in well nourished developed countries and also higher gain in BMI during childhood is related to early onset of menarche [20]. Onset of menarche is influenced by a minimal requisite BMI, nutrition, environmental factors, socioeconomic conditions, and knowledge of preventive health care [21]. Other Indian authors have given mean age of menarche between 12-14 years Nazeema et al. [22] (12.2 years), Chaturvedi et al. [23] (13.7 years), Patil MS [24] (13.45 years) and Shalini et al. [25] (14.02 years).

Although this study was done in urban area but majority (71%) of adolescents used cloth pieces and 27.2% used sanitary pads. Similarly Kale KM et al. [26] reported use in 30.9% of cases but Yasmin et al.

[27] reported in 83.2% use of sanitary pads. Published literature showed that use of cloth piece both new and used is a common practice in Indian adolescents, of both urban and rural regions. It was also observed that various forms of taboos were also practiced in 80.4% of cohort. This included avoiding holy places, restriction on particular food, not touching other people/books, prohibition in kitchen and temple during the phase as they felt that they were unclean in some way during menses. Myths and taboos followed, in Indian adolescents, have also been reported by other authors Kaundal M & Thakur B [28], Yasmin et al. [27], Behera et al. [29] and Chothe et al. [30]. Thus this study also reveals lack of knowledge about puberty and menstruation as well as various misconceptions among Indian adolescent girls. In addition depression (40%) and indifference (35%) was the most common reaction in adolescents at menarche (Table 5). Thus there is a need to educate and emphasis should be given on counseling the adolescents about the normal physiologic and anatomical changes in puberty.

Clinicians have important role in understanding of the needs and menstrual patterns of adolescent girls and should possess necessary ability to evaluate an adolescent girl patient.

### Summary

Although this study group included girls of urban background only, most of the girls are too shy to reach the health facilities and avail treatment. The magnitude of health problems in adolescents is large. Thus the younger girls actually seeking medical attention constitute a small fraction of adolescent population. To extend medical aid at a larger scale, it may be beneficial to establish "Adolescents Clinics" exclusively for these girls. These clinics will not be specialized to diagnose and treat their health problems but will also provide an element of privacy. In addition to educating these girls stress should also be laid on improving nutrition, sex education and pre-marital counseling. A girl child has right over education and empowerment to help her smooth transformation from adolescent girl into reproductive adult women. The responsibility of this lies with parents, teachers, administrators, social workers and personnel of medical and paramedical profession. Ensuring good adolescent reproductive health will ensure "Safe Motherhood".

### Abbreviations

UNICEF-United Nations Children's Emergency Fund;

OPD-Out Patient Department;

PCOD-Poly Cystic Ovarian Disease;

WHO-World Health Organisation.

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