A STUDY ON MENSTRUAL HEALTH IN SCHOOL GOING ADOLESCENT GIRLS FROM SOUTH INDIA

Vinitra Dayalan[1], Sripreethika Rajavelu[2], Sampath Kumari[3], Vignesh Mantharam[4]

[1]Assistant Professor, Department of Obstetrics and Gynaecology, Government Chengalpattu Medical College and Hospital, Chengalpattu.
[2]Assistant Professor, Department of Obstetrics and Gynaecology, Government Chengalpattu Medical College and Hospital, Chengalpattu.
[3]Professor, Department of Obstetrics and Gynaecology, Government Chengalpattu Medical College and Hospital, Chengalpattu.
[4]Resident, Department of Obstetrics and Gynaecology, Madras Medical College and Rajiv Gandhi Government General Hospital.

ABSTRACT

BACKGROUND
The major Problems occurring during the adolescent period is related to menstrual cycle. Data regarding the burden of menstrual disturbances in school going children of South India is lacking. Assessing the burden in such children may aid in revealing the current state of menstrual health and hence aiding the policy makes to take appropriate measures. Hence, we assessed the prevalence of menstrual disturbances in school going adolescent girls of South India.

The primary aim of this study is to assess the burden of menstrual disorders in school going adolescent girls. The secondary objective were to assess individual menstrual disturbance in the study group and to assess the various factors influencing the menstrual health.

MATERIALS AND METHODS
This cross-sectional study was conducted in two government girl's higher secondary school in the state of Tamil Nadu, India. After receiving approval, a structured questionnaire in the regional language (Tamil) was distributed to the school going children between the age of 10 and 19 years. Demographic data and details regarding menstrual health were collected. Frequency of medical assistance and school absenteeism were also analysed in patients with dysmenorrhea. Data were analysed using the SPSS 13.0.1.

RESULTS
Data of 340 girls who have attained menarche and who have completed the questionnaire was analysed. The median age of menarche in the study group was 13 years. (IQR; 12, 14)) and 13.2% attained early menarche(before12 years). There was a higher prevalence of menstrual disturbances; (46.2%) with polymenorrhea and (12%) with oligomenorrhea. there was a significantly higher usage of sanitary pads in our study population in our study group (98%). In addition, (41.5%) had premenstrual symptoms and (36.8%) had dysmenorrhea. With a higher prevalence of dysmenorrhea (n=125), 35 had school absenteeism. But, only 8/35 consulted a physician and took treatment. Five of these patients were told to have PCOS and 2 were diagnosed to have hypothyroidism. Factors associated with early menarche included overweight (p<0.05) and less involvement in physically demanding activities (p<0.05). Girls who take pure vegetarian diet had decreased prevalence of menstrual irregularities (polymenorrhea or oligomenorrhea) (p<0.03).

CONCLUSION
Menstrual disorders form a major source of comorbidity in our study group. About 1 in 10 girls attain menarche at an early age less than 12 years and more than half of the girls had menstrual disturbances. But, a very few children seeked medical help for the same, which led to diagnosis of treatable gynaecological diseases.

KEYWORDS
Adolescent, Menstrual Disorders, Polymenorrhea, Oligomenorrhea, Dysmenorrhea.

BACKGROUND
Adolescence is defined as a transitional period between childhood and adulthood encompassed by changes in physical, psychological and social development.[1,2] The major changes during this adolescent period is menstrual cycle disturbances. Normal puberty starts with the awakening of complex neuroendocrine mechanisms, which depends on the activation of hypothalamopituitary ovarian axis. With puberty, irregularities are quite physiological due to an immature hypothalamopituitary ovarian axis.[2]

Lack of appropriate investigation and treatment may lead to missing early diagnosis and delay in treatment of conditions like anemia, systemic hemostatic static conditions, endometriosis, polycystic ovarian syndrome and hypothyroidism. The age at menarche shows many socioeconomic, environmental, nutritional and geographical differences in the societies.[3,4] Majority of school absenteeism has been attributed to menstrual disturbances in adolescent girls[4].Data regarding the burden of menstrual disturbances in school going children of South India is lacking. Assessing the burden in such children may aid in revealing the current state of menstrual health and hence aiding to take appropriate measures. Hence, as a pilot study, we chose to assess the prevalence of menstrual disturbances in school going adolescent girls of South India.

Aims and Objectives
The primary aim of this study is to assess the burden of menstrual disorders in school going adolescent girls. The secondary objectives were to assess individual menstrual disturbance in the study group and to assess the various factors influencing the menstrual health.

MATERIALS AND METHODS
This cross-sectional study was conducted in two Government Girls Higher Secondary School in the state of Tamil Nadu, India. A letter explaining the need for the study was given to the principals of the schools and approval letter from the respective schools were obtained. After receiving approval, a structured questionnaire in the regional language (Tamil) was distributed to the school going children between the age of 10 and 19 years and the one of the investigators of the study went onsite to answer any doubts regarding the completion of the questionnaire. Confidentiality of the information given by the students were assured. Data was collected regarding age, religion, socioeconomic status, dietary habits, physically demanding activities, history of any medical or surgical problems, the age of menarche, gynaecological age and BMI. Details of menstruation included cycle length, duration, amount of flow and dysmenorrhea were collected. Frequency of medical assistance and school absenteeism were also analysed in patients with dysmenorrhea. Definition of individual menstrual disturbances were defined as in Table 1.

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 13.0.1 Means, standard deviations and simple percentage were determined. Chi-square value was used for significance level. $P < 0.05$ was considered significant using the Pearson's x^2 test.

RESULTS
After approval, the structured questionnaire was distributed to 803 adolescent girls. 118 girls refused to answer the questions. 282 questionnaires were incomplete. 63 did not attain menarche at the time of interview of which 2 girls had primary amenorrhea and these students were not included in the analysis of menstrual disturbances. Data of 340 girls who have attained menarche and who have completed the questionnaire was analysed.

Demographic Profile- Mean age of the study population was 14.77 ± 1.46 years with majority of them lying between 14 and 17 years of age. Median age of menarche was 13 years (IQR 12, 14) and 45 (13.2%) attained early menarche (before 12 years) as in Figure 1. 243 (72%) were of the lower socioeconomic status and 97 (28%) were at middle and upper socioeconomic status. 246 (72%) girls had a normal body mass index (5-84th percentile); 75 (22%) were underweight (<5th percentile) and 15 (4%) were overweight (85-95th percentile) and 4 (1.1%) were obese (>95th percentile).

Dietary Habits- 91% girls were taking non-vegetarian diet (once in a week 70% and more than once a week 21%); 94% answered regarding intake of fruits (80% once a week and 14% more than once a week); 85% answered regarding intake of vegetables (50% once a week, 35% more than once a week); 99% were taking deep fried snacks regularly (70% once a week and 29% more than once a week).

Physical Activities- 25% girls actively involved in sports; 9% in swimming and 8% in dancing. Rest of them followed a sedentary lifestyle.

Menstrual Irregularities- Of the studied population, 143 (42%) had regular menstrual cycles, whereas 157 (46.2%) had polymenorrhea and 40 (12%) had oligomenorrhea. 23 (7%) had menorrhagia, 45 (13.2%) had menstrual period lasting for more than 5 days, 29 (8.5%) had secondary amenorrhea. There was a higher usage of sanitary pads in our study group (335.i.e.98.5%) 141 (41.5%) had premenstrual symptoms, 47 (13.8%) had weight gain, 206 (60.6%) had onset of pain before menstruation, 125 (36.8%) had dysmenorrhea and 20 (5.9%) had pain persisting after menstruation as in Table 2 with a higher prevalence of dysmenorrhea (n=125), 35 (10.29%) had to take leave due to dysmenorrhea. But, only 8 (2.35%) consulted a physician and took treatment. Five out of eight girls were told to have PCOS and two had hypothyroidism. Oral pain killers were used by 17 (5%), self-medication (allopathic by 9 (2.64) 13.6% and home-based therapy by 10 (2.94%)), 4.8% had severe dysmenorrhea requiring hospital admission and parenteral injections. Factors associated with early menarche included overweight (p<0.05) less involvement in physically demanding activities like sports, swimming and dancing (p <0.05) and lower socioeconomic status (middle and upper)(p<0.05) as depicted in Table 3, 4, 5.

Patients with lower status had higher prevalence of polymenorrhea (as compared to those at middle and higher socioeconomic status (p<0.05) as described in Table 6). Girls who take pure vegetarian diet had decreased prevalence of menstrual irregularities (polymenorrhea or oligomenorrhea) (p <0.03). However, individual dietary

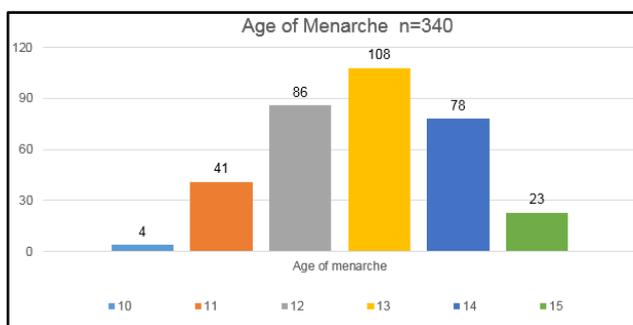component that were assessed (fruits, vegetables, deep-fried snacks) did not differ between the groups.

Figure 1. Distribution of Age of Menarche

Condition	Definition
Early menarche	Menarche before 12th birthday
Primary amenorrhea	Absence of menses by the 16th birthday
Oligomenorrhea	Average length of the cycle more than 35 days
Polymenorrhea	Average cycle duration of less than 21 days
Secondary amenorrhea	Absence of menses after the onset of puberty for more than 6 months
Menorrhagia (heavy menstrual loss)	Use of 5 or more fully-soaked pads a day for any duration during the menstrual periods
Dysmenorrhea	Pain during menstruation

Table 1. Definition of Menstrual Abnormalities

Menstrual Disturbance	No. of Girls (n=340)
Polymenorrhea	157 (46.2)
Oligomenorrhea	40 (12)
Primary amenorrhea	1
Secondary amenorrhea	29 (8.5)
Premenstrual symptoms	141 (41.5)
Premenstrual weight gain	47 (13.8)
Pain before menstruation	206 (60.6)
Dysmenorrhea	125 (36.8)
Pain after menstruation	20 (5.9)

Table 2. Menstrual Disturbances in Our Study

Modified Kuppusamy Socioeconomic Status Scale	Socioeconomic Status (IV and above)	Socioeconomic Status (I-III)	P value
Early menarche (n=45)	8 (17.8%)	37 (81.2)	0.001

Table 3. Comparison of Socioeconomic Status and Early Menarche

BMI	Under-weight	Normal	Over-weight	Obese	P value
Early menarche (n=45)	1 (1.3)	40 (16.3)	4 (26.7)	0 (0)	0.003

Table 4. Comparison of Socioeconomic Status and Body Mass Index (BMI)

Involvement	Absent	Present	P value
Early menarche (n=45)	43 (95.6)	2 (4.4)	<0.05

Table 5. Comparison of Involvement in Physically Demanding Activities and Early Menarche

Socioeconomic Status	Lower Socioeconomic Status	Higher Socioeconomic Status	p-value
Oligomenorrhea (n=40)	37 (92.5)	3 (7.5)	0.037
Polymenorrhea (n=157)	151	6	0.037

Table 6. Comparison of Menstrual Cycle Irregularities with Socioeconomic Status

Diet	Vegetarian Diet	Non-Vegetarian Diet	p-value
Oligomenorrhea (n=40)	2 (5)	38 (95)	0.037
Polymenorrhea (n=157)	8 (5.1)	149 (94.9)	0.037

Table 7. Comparison of Menstrual Cycle Disturbances with Dietary Habits

DISCUSSION

Though menstruation is a physiological process, it is associated with premenstrual and menstrual disturbances especially in the adolescent age group. These disturbances may sometimes be very severe affecting the daily activities of a school going girl.

In our study, the median age of menarche was 13 years, which is similar to the age at menarche determined by other studies in India, i.e. Maharashtra-13.67 years[3] in West Bengal 12.8 years.[5] In the current study, regular menstrual cycles were reported by 42% girls, polymenorrhea and oligomenorrhea were reported in 46.2% and 12.5% respectively, which is higher than in the previously reported studies by Gujjar et al (9.9%).[6] This could be because of changing trends in lifestyle, dietary habit, stress, hormonal imbalance or some medical reasons, which requires gynaecological assessment at the earliest. The median duration of menstrual flow was 3 (IQR 1,5) days, which was similar to study conducted in Central India,[3] but lower than that in the study conducted in Turkey where the menstrual flow lasting more than 8 days.[7]

36.8% had dysmenorrhea, which was lower than the current available studies. In a study conducted at Central India, 56.15% of the girls had dysmenorrhoea, 61.27% of the girls reported dysmenorrhoea in the study conducted in Dharan and Turkey.[8,9] There was a significantly higher usage of sanitary pads in our study population in our study group (98%) which is higher than that studied by Anna Maria et al (67%) and Usha Rani et al (85%).[10,11] this could be attributed to the free supply of sanitary pads to school going adolescents of Tamil Nadu 41.5% had premenstrual symptoms. Headache, fatigue, feeling of increased weight, abdominal bloating, backache, breast heaviness and joint pain were the most common premenstrual symptoms experienced by the adolescent girls. Premenstrual symptom

has been reported to be one of the most distressing problems associated with menstrual cycle. School Absenteeism in 35 students (10.29%) was due to menstrual disturbances. But only eight consulted a physician and took treatment and were diagnosed to have treatable gynaecological conditions like PCOS and hypothyroidism. It is possible that the girls lack proper information and tend to assume that their menstrual pattern is normal and hence do not report them at the regular school health checkups. If this is the main cause found, efforts to improve menstrual health education needs to be instituted. Dysmenorrhea and premenstrual symptoms were perceived as most distressing symptoms leading to school absenteeism.[12] the study results show the disturbance of routine activities of the study subjects due to dysmenorrhea and premenstrual symptoms[13,14] Self-medication was practiced by 5.58% of the adolescent girls. However, the study conducted at Turkey reported that 56.60% of the adolescent girls practiced self-medication[7] and 7.16% as in Maharashtra.[3] School girls from a lower socioeconomic class had a statistically significant lower mean age of menarche compared to those in higher socioeconomic class in both urban and rural area. This is in contrast with the finding reported by other studies (3, Ikaraoha CI et al, 2005, Ikechebelu JI, 1991). This may be explained by the lower distribution of girls at higher socioeconomic status. School girls less involved in physical activity had early age of menarche as compared to girls in non-sport activities. Similar findings were reported from other studies.[3,15]

CONCLUSION

Menstrual disorders form a major source of comorbidity in school going adolescent girls. About 1 in 10 girls attain menarche at an early age less than 12 years due to overweight and sedentary lifestyle. In our study group, more than half of the girls had menstrual disturbances. But, a very few of them seeked medical help for the same which led to diagnosis of treatable gynaecological diseases. This makes an urgent need to screen all adolescent girls with menstrual disturbances for major gynaecological disorders. Improvement in menstrual health will not only improve the academic performances of the girls but also may prevent future problems like PCOS, obsesity and infertility. Promoting positive attitude towards management of menstrual disturbances is the need of the hour. It is important for the parents, teachers and health care professional to be adequately involved in promotion of menstrual health. Hence reproductive health should be included in the routine curriculum of these students.

REFERENCES

[1] Ernst M, Pine DS, Hardin M. Triadic model of the neurobiology of motivated behaviour in adolescence. Psychol Med 2006;36(3):299-312.

[2] Plant TM. Neuroendocrine control of the onset of puberty. Front Neuroendocrinol 2015;38:73-88.

[3] Dambhare DG, Wagh SV, Dudhe JY. Age at menarche and menstrual cycle pattern among school adolescent girls in central India. Glob J Health Sci 2012;4(1):105-11.

[4] nupriya Agarwal, MS, MRCOG and Annapoorna Venkat, DGO, MMed et al, Questionnaire Study on Menstrual Disorders in Adolescent Girls in Singapore. J Pediatr Adolesc Gynecol (2009) 22:365e371

[5] Dasgupta A, Sarkar M. Menstrual hygiene: how hygienic is the adolescent girl? Indian J Community Medicine 2008;33(2):77-80.

[6] Dhingra R, Kumar A, Kour M. Knowledge and practices related to menstruation among tribal (Gujjar) adolescent girls. Ethno-Med 2009;3(1):43-48.

[7] Sule ST, Ukwenya JE. Menstrual experiences of adolescents in a secondary school. J Turkish-German Gynecol Assoc 2007;8(1):1-14.

[8] Houston AM, Abraham A, Huang Z, et al. Knowledge, attitudes, and consequences of menstrual health in urban adolescent females. J Pediatr Adolesc Gynecol 2006;19(4):271-275.

[9] Sharma M, Gupta S. Menstrual pattern and abnormalities in the high school girls of Dharan: a cross sectional study in two boarding schools. Nepal Med Coll J 2003;5(1):34-36.

[10] Menstrual hygiene management among adolescent girls in india: a systematic review and meta – analysis. Anna Maria van Eijk et al assessment of menstrual hygiene practices among adolescent girls.Uha Rain et al Stanley medical journal, Vol 3, Issue 1, January – March , 2016

[11] Ikaraoha CI, Mbadiwe IC, Igwe CU, et al. Menarcheal age of secondary school girls in urban and rural areas of rivers state, Nigeria. Online J Health Allied Sci 2005;2:4.

[12] Drife JO, Magowan BA. Normal menstrual cycle. In: Magowan B, Thomson A, Owen P, eds. Clinical obstetrics and gynecology. 3rd edn. Saunders 2004:p. 121.

[13] Banikarim C, Chacko MR, Kelder SH. Prevalence and impact of dysmenorrhea on Hispanic female adolescents. Arch Pediatr Adolesc Med 2000;154(12):1226-1229.

[14] Busch CM, Costa PT, Whitehead WE, et al. Severe perimenstrual symptoms: prevalence and effects on absenteeism and health care seeking in a non-clinical sample. Women Health 1988;14(1):59-74.

[15] Ikechebelu JI. The age of menarche in Nigerian school girls, its relationship to socioeconomic status with comments on the secular trends. Orient J Med 1991;1:182-185.