International Journal of Medical and Health Sciences

Journal Home Page: http://www.ijmhs.net ISSN:2277-4505

Original article

Influence of Body Mass Index on Menstrual Irregularities in Adolescent girls

Sheetal Barde[1*], Sheela Upendra[2], Seeta Devi[3]

[1&3]Assistant Professors, [2]Associate Professor, Symbiosis College of Nursing, Symbiosis International University, Pune.

ABSTRACT

Objective: To evaluate the influence of Body Mass Index on the menstrual pattern in adolescent girls. **Methods:** Fifty adolescent girls who attained menarche were selected for the study. The data was collected by using a pre-designed pre-tested questionnaire. BMI was calculated using the formula: BMI (kg/m^2) = Weight (kg) / Height 2 (m^2). **Results**: The mean age of the girls was 19.96 (range 18 – 21 years). 49% of the fathers worked in the public sector and 2% worked in the private sector, 21% were manual workers and 30% did not mention the status of their father's job.10% of the adolescent girls had 10 years of age of menarche, 18% of them had 11 years of age of menarche, 42% of them had 12 years of age of menarche, 20% of them had 13 years of age of menarche and 10% of them had 14 years of age at menarche. Nutritional status of the girls was determined by their Body mass index (BMI). 58% of the adolescent girls were normal (having BMI 18.5-24.9), 24% of them were overweight (BMI 25-29.9) and 4% of them were obese (BMI>=30). **Conclusion**: The study concludes that a many of the girls were obese. Out of the fifty girls who were checked, fourteen percent were found to be underweight. Overweight and Obese girls had infrequent periods.A statistically significant relationship was found between BMI and menstrual pattern $P < 0.005$)

KEYWORDS: Menstrual pattern; Body mass index; Adolescence.

INTRODUCTION

Adolescence is a phase separate from both early childhood and adulthood. It is a transitional period that requires special attention and protection. Physically, children go through a number of transitions while they mature. We now know that the brain undergoes quite substantial developments in early adolescence, which affect emotional skills as well as physical and mental abilities. Adolescence is also when gender norms are solidified rejected or transformed [1].

Adolescence is a period of maturity, a point of physical, emotional, social and psychological change. It is considered to be the period between ages 13 and 19. Anemia is the major nutritional deficiency found in this group in Pakistan where more than 40 percent of total female population is anemic. This includes 35 percent girls of 15-19 years of age [2]. It is uncommon to find a major pathology to explain the irregularities. The pattern of menstrual cycle will have a significant influence on a girl's reproductive life. It is important to understand what a normal menstrual pattern is, in order to assess what leads to an irregular cycle or abnormal flow.

The age of menarche is determined by general health, genetic, socio-economic and nutritional factors. The mean age of menarche is typically between 12 and 13 years [2], [3]. Most women bleed for 2 to 7 days during their first menses [4].Most normal cycles range from 21 to 45 days, despite variability even in the first gynecologic year, although short cycles of fewer than 20 days and long cycles of more than 45 days may occur. By the third year after menarche, 60% to 80% of menstrual cycles are 21 to 34 days long, as is typical of adults [4], [5]. BMI as classified by WHO describes having <16kg/m2 as severe underweight, 16.0 – 16.9kg/m^2 as moderate underweight and 17.0 – 18.49kg/m^2 as mild underweight. Normal BMI range is 18.5 – 24.99 kg/m^2. Anything > 25 kg/m^2 is considered to be overweight, with 25 – 29.99 kg/m^2being classified as pre-obese and >30 kg/m^2 as obese.

Menstrual problems are generally perceived as only minor health concern and thus irrelevant to the public health agenda particularly for women in developing countries who may face life threatening condition. Menstrual cycle is normal physiological process that is characterized by

periodic and cyclic shedding of progestetional endometrium accompanied by loss of blood which is additional vital sign adds a powerful tool to the assessment of normal development and the exclusion of pathological conditions in adolescent and young girls [6]. Some variety of menstrual dysfunction occurs in adolescent girls which may affect normal life of adolescent and young adult women. Physical, Mental, Social, Psychological, Reproductive problems are often associated with menstrual irregularities and menstrual problems. Due to change in life style, habits, diet, the prevalence of obesity has increased in developed world which results in decreased age at menarche. [7]

The objective of this study was to evaluate the influence of Body Mass Index and nutritional status on the menstrual pattern in adolescent girls.

MATERIALS AND METHODS

The current study was a non-experimental survey study carried out between Nov – Dec 2014. A total of fifty adolescent girls aged 18 - 21 from three Nursingcolleges were selected after getting their consent. A simple random method was used to collect the data. The Administrative Officerwas contacted for permission to allow the questionnaires to be distributed among the college girls. The data was collected by using a pre-designed pre-tested questionnaire.

The questionnaire consisted of age, residential place, annual income, age of menarche, date of last menstrual period, details of menstrual cycle, including cycle length, number of days the period lasts, menstrual flow (i.e. scanty, normal or heavy), presence or absence of dysmenorrhea, premenstrual symptoms such as headache, giddiness, breast tenderness and abdominal cramps, and any other symptoms such as diarrhea or vomiting were noted. Height and weight was also measured. BMI (body mass index was calculated using the formula: BMI (kg/m 2) = Weight (kg) / Height 2 (m^2).

RESULTS

The mean age of the girls was 19.96 (range 18 – 21 years). The socioeconomic status was determined by their father's occupation and monthly income. 49% of the fathers worked in the public sector and 2% worked in the private sector, 21% were manual workers and 30% did not mention the status of their father's job.62% of the girl's fathers belonged to the lower middle class status with a monthly income between (Rs.) 2000 – 7000. 36% belonged to the middle class with an income of Rs.7000 – 12,000 while 2% of the girls belonged to a low socio economic status with father's income between 1000 – 2000 rupees per month.

Figure 1: Age of Menarche of Adolescent girls

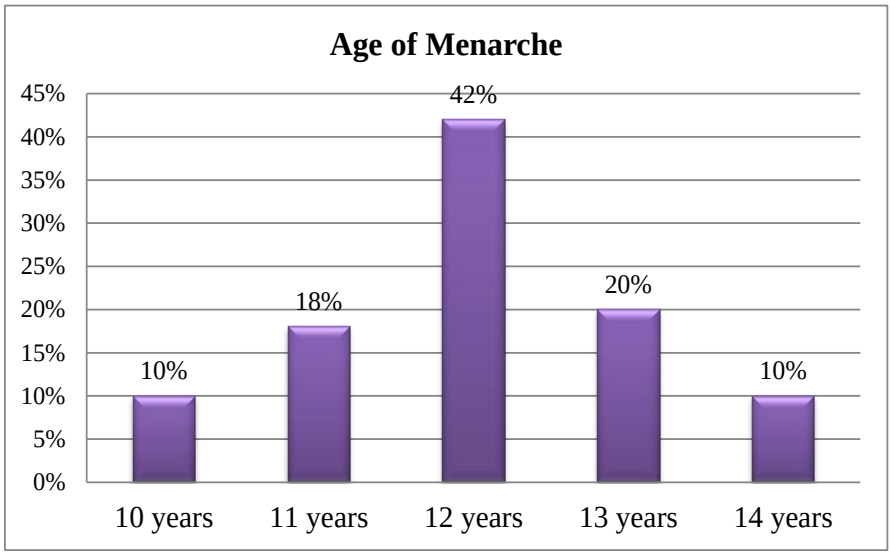


Table 1: Showing the Menstrual Irregularities in Adolescent girls

Menstrual Cycle Variable	Frequency	%
How long does your period last?		
2 to 3 days	14	28%
3 to 4 days	8	16%
4 to 5 days	15	30%
More than 5 days	13	26%

On the average, how long is your monthly cycle		
20 to 24 days	9	18%
24 to 28 days	14	28%
28 to 32 days	14	28%
More than 32 days	13	26%
How is your Menstrual flow usually		
Scanty (1 Sanitary Pads per day)	18	36%
Normal (5 Sanitary Pads per day)	18	36%
Heavy (8 Sanitary Pads per day)	14	28%

Nutritional Status: Nutritional status of the girls was determined by their Body mass index (BMI). 58% of the adolescent girls were normal (having BMI 18.5-24.9), 24% of them were overweight (BMI 25-29.9) and 4% of them were obese (BMI>=30).The results are shown in the table below.

Table 2: Body mass index among Adolescent girls

BMI	Frequency	%	P value
Underweight (BMI <18.5)	7	14%	(X_2^2=102.8, P<0.005)
Normal (BMI 18.5-24.9)	29	58%	
Overweight (BMI 25-29.9)	12	24%	
Obese (BMI>=30)	2	4%	

BMI and menstrual pattern: 72% girls with BMI 18.5 -24.9 had a normal menstrual pattern. All fourteen girls with a BMI from 25 to >=30 had infrequent cycles. A statically significant relationship was observed between BMI and menstrual pattern P <0.005. The mean age of menarche was (12.6 ±1.3 years), with statistical significant difference between BMI categories in relation to age of menarche and menstrual regularity (P<0.05). Regarding to dysmenorrheal, the majority of obese girls have dysmenorrheal (95.0%). The majority of girls with healthy weight had regular menstruation (89.9%). On the other hand, 40% of the obese girls had irregular menstruation.

DISCUSSION

In the present study, the mean age at menarche of young girls was found to be 10% of the adolescent girls had 10 years of age of menarche, 18% of them had 11 years of age of menarche, 42% of them had 12 years of age of menarche, 20% of them had 13 years of age of menarche and 10% of them had 14 years of age at menarche. By 13 years of age, 90% of females will have had menarche. All the adolescent girls in the present study attained menarche before the age of 14, therefore none had primary amenorrhea

The menstrual flow was found to be 36% of them had scanty menstrual flow, another 36% of them had normal menstrual flow and 28% of them had heavy menstrual flow similar to a study by Begum J et al[6]which showed a higher percentage of girls to have scanty flow and lower percentage of those with heavy flow. Dysmenorrhea is one of the commonest problems in this age group, as reported by other researchers [8], [9]. This study showed that 52%of them had painful period. 32% of them had pain before periods, 30% of them had had pain during periods and 38% of them had pain after periods. There have been studies, which have emphasized the importance of Body Mass Index (BMI) as an index of nutritional assessment [10], [11].

In this study nutritional status of the girls was determined by their BMI. 58% of the adolescent girls were normal (having BMI 18.5-24.9), 24% of them were overweight (BMI 25-29.9) and 4% of them were obese (BMI>=30). There have been 2 large studies by Karlberg and Wang [12], [13] that have confirmed earlier onset of puberty related to a higher gain in BMI. In our study 72% girls with BMI 18.5 -24.9 had a normal menstrual pattern. All fourteen girls with a BMI of 25 – 29.9 to >=30 had infrequent cycles. (oligomenorrhea).

CONCLUSION

The study determines problems related to menstruation are quite regular and often result in the disturbance of the daily

routine of the adolescent girls, therefore it is important that college officials and faculties recognize these problems and need to be thoughtful to their problems. Further studies should be performed to determine the reason for this tendency, and newer approaches need to be employed.

CONFLICT OF INTEREST

Author has no relationship/condition/circumstances that present a potential conflict of interest.

SOURCE OF FUNDING

The authors did not receive any financial support from any third party related to the submitted work.

REFERENCES

1. unicef.org (homepage on the internet) UNICEF Adolescents and youth (updated on 29 May 2014). Available from: http://www.unicef.org/adolescence/
2. Herman-Giddens ME, Slora EJ, Wasserman RC, Bourdony CJ, Bhapkar MV, Koch GG, et al. Secondary sexual characteristics and menses in young girls seen in office practice: A study from the Pediatric Research in Office Settings network. Pediatrics. 1997;99(4):505–512.
3. World Health Organization Task Force on Adolescent Reproductive Health. World Health Organization multi-center study on menstrual and ovulatory patterns in adolescent girls. I. A multicenter cross-sectional study of menarche. J Adolesc Health Care. 1986;7: 229–235.
4. Flug D, Largo RH, Prader A. Menstrual patterns in adolescent Swiss girls: A longitudinal study. Ann Hum Biol. 1984;11(6):495–508.
5. Widholm O, Kantero RL. A statistical analysis of the menstrual patterns of 8,000 Finnish girls and their mothers. ActaObstetGynecolScand Suppl. 1971;14:1–36.
6. Begum J, Hossain AM, Nazneen SA. Menstrual pattern and common menstrual disorders among students in Dinajpur College. Dinajpur Med Col J . 2009;2:37–43.
7. Chowdhury S, Shahabuddin AK, Seal AJ, Talukder KK, Hassan Q, Begum RA, et al. Nutritional status and age at menarche in a rural area of Bangladesh. Ann Hum Biol. 2000;27:249–256.
8. Bankarim C, Chacko MR, Kelder SH, Prevalence of Dysmenorrhea on Hispanic female adolescents. Arch Pediatric Adolesc Med. 2000;154:1226-1229.
9. Aggarwal K, Kannan AJ, Puri A, Sharma S. Dysmenorrhea in Adolescent Girls in Rural Area of Delhi, A Community based Survey. Ind J Public Health. 1997;41(8):84–85.
10. Cherian R, Rajasree S, Soman CR. Anthropometric assessment of malnutrition comparison of two age independent criteria. Ind J Nut Diet. 1988;25:82.
11. Rao D. Hanumantha Nutrition Profile of Indian Tribes. Nutrition News published by National Institute of Nutrition. 1996;17 (2):1–6.
12. Karlberg J, He Q. BMI in childhood and its association with height gain, timing of puberty and final height. Pediatr Res. 2001;49:244–251.
13. Wang Y. Is obesity associated with early sexual maturation? A comparison of the association in American boys versus girls. Pediatrics. 2002;110:903–910.

---

*Corresponding author: Sheetal Barde
E-Mail: shitalbarde@scon.edu.in