Menstrual characteristics and association of body mass index with dysmenorrhoea among the medical students in South India

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Abstract

Introduction: Menstrual cycle is a physiological phenomenon consisting of cyclical shedding of endometrium, occurring on an average of 28±7 days in every woman's life in response to hormones during their reproductive years. The production of hormones from hypothalamus (gonadotropin-releasing hormone), pituitary (FSH and LH) and ovaries (progesterone and androstenedione, etc.) are regulated by positive and negative feedback mechanisms. The interaction of these hormones result in the menstrual cycles. Dysmenorrhea, is a cyclical painful cramping sensation in the lower abdomen, which might radiate to the back, occurring before and/or during menstruation. Its prevalence ranges between 25-90%. Medical students endure relatively greater amount of stress due to the vast subject which is to be studied in their MBBS course coupled with the lack of outdoor physical activity. Also, a high prevalence of irregularity of periods if undetected early can lead to polycystic ovarian diseases which are one of the causes of infertility. The menstrual characteristics (the menstrual cycle bleeding patterns, length, etc.) are important indicators of endocrine and uterine dysfunctions/abnormalities like Polycystic Ovarian Disorders. Therefore, this study was conducted to assess the menstrual pattern in young adult females.

Material and Methods: A cross sectional study was conducted among female MBBS students and interns of a medical college in South India. Data was collected in a semi-structured questionnaire consisting of details regarding the menstrual history followed by clinical examination and relevant investigations as necessary.

Results: Total 204 female MBBS students with an average age of 21.1±2 years participated in the study. Polymenorrhea and oligomenorrhea was seen in 3% and 13% of the students respectively. Dysmenorrhea was reported by 53.9% of the students. Study found that a high percentage (83.3%) of students who were over weight/obese suffered from dysmenorrhea. Whereas a lesser percentage underweight (40.5%) and normal weight (59.3%) students suffered from dysmenorrhea. This association was found to be statistically significant.

Conclusion: Early diagnosis and management of dysmenorrhea should be done and appropriate necessary life style modification should be encouraged among young females to reduce the incidence of PCOD and metabolic syndrome later in life.

Keywords: Dysmenorrhea, PCOD, Medical students, South India.

Introduction

Menstrual cycle is the physiological phenomenon, consisting of cyclical shedding of endometrium, occurring on an average of 28 ± 7 days in every woman's life in response to hormones during their reproductive years. An average blood loss of 50 ± 30 ml occurs in every menstrual cycle which lasts for about 5 days, accounting to around 67 months of menstrual bleeding over a lifetime of a female.[1,2] The production of hormones from hypothalamus (gonadotropin-releasing hormone), pituitary (follicle stimulating hormone and luteinizing hormone) and ovaries (progesterone and androstenedione, etc.) are regulated by positive and negative feedback mechanisms. The interaction and the levels of these hormones regulate the duration and regularity of the menstrual cycles,[1-5]

The aetiology of menstrual disorders such as dysmenorrhea, premenstrual symptoms, menorrhagia, polymenorrhea, abnormal vaginal bleeding, amenorrhea, oligomenorrhea and irregular menstruation among the can be due to various psychological as well as organic causes. The increased levels of stress can affect the hormonal milieu, there by affecting the menstrual cycles.[5] There are various types of menstrual disorders, including dysmenorrhea, premenstrual symptoms, menorrhagia, polymenorrhea, abnormal vaginal bleeding, amenorrhea, oligomenorrhea, and irregular menstruation. Studies have shown that a large proportion of the female population of reproductive age suffers from menstruation-related health issues. Menstrual problems not only carry an economic burden but are also one of the most common causes of absenteeism and poor academic performance among young females, affecting their social, physical and psychological dimensions of health.[1,2,4,5]

Dysmenorrhea, is a cyclical painful cramping sensation in the lower abdomen, which might radiate to the back, occurring before and/or during menstruation. Other symptoms associated with dysmenorrhea are fatigue, nausea, gastrointestinal disturbances, dizziness, fatigue among others.[6-10] The causes of dysmenorrhea are higher levels of endometrial prostaglandins. It begins soon after menarche. It is the most common gynaecologic complaint among adolescent and adult females.[8,11] The exact prevalence and epidemiology of primary dysmenorrhea is tough to be ascertained because it is a symptom that is perceived subjectively by females and also there has not been a standard diagnostic criteria applied to assess

dysmenorrhea by researchers. There is a wide range in the documented global prevalence of dysmenorrhea (25 to 90%) among women. Around 10% of Indian population comprise of people in the age group of 18-25 years, of which, about 50% is female population.[5] In India, dysmenorrhea prevalence ranges between 50-87%.[8,12-14]

The medical students endure relatively greater amount of stress due to the vast subject which is to be studied during their MBBS course. The medical students also lack sufficient outdoor physical activity.[5] A high prevalence of irregularity of periods among them if undetected in early stages, can lead to polycystic ovarian disease which is one of the causes of infertility.[15] The menstrual characteristics (the menstrual cycle bleeding patterns, length, etc.) are important indicators of endocrine and uterine dysfunctions/abnormalities like Polycystic Ovarian Disorders.[4] Therefore, this study was conducted to assess the menstrual pattern in young adult females

Materials and Methods

After obtaining institutional ethics committee approval, a cross sectional study was conducted among female MBBS students and interns of Basaveshwara Medical College & Hospital, Chitradurga in the year of 2018 (September to November). Data was collected in a semi-structured questionnaire which was administered to all undergraduate female medical students in the age group of 18-25years, after explaining the purpose of the study and obtaining their informed consent.

The questionnaire consisted of details regarding the menstrual history- the duration and amount of flow of recent three menstrual cycles, associated symptoms like dysmenorrhoea, leg cramps, and any other bodily changes like weight gain, hair growth etc was taken. These students were later clinically examined by OBG specialist and their anthropometric measurements such as height, weight BMI, any signs of hirsutism or androgenism were recorded.

Exclusion criteria consisted of students who were married, those students who were on hormonal medication and primary amenorrhoeic females. A total of 204 female students participated in this study.

Statistical Analysis

The data was compiled in Microsoft excel spread sheet and analyzed using SPSS for windows version 16.0. All the characteristics are summarized descriptively. For continuous variables, the summary statistics of N and mean were used. For categorical data, the number and percentage were used in the data summarized. Chi square test was applied to test the significance of association of categorical variables.

Results

A total of 204 female students who met the inclusion criteria participated in the study.

The average age of the students was 21.1 ± 2 years. A 3% of the students had polymenorrhoea i.e. menstrual interval of less than 21 days. Oligomenorrhoea i.e. menstrual interval of more than 35 days was found in 13% of participants. Length of the menstrual interval was normal (i.e. 21-35 days) in 77% of the students whereas 7% students had irregular menstrual cycle.

Bleeding period varied from 1 to 12 days in last three menstrual cycles in the study population. A 10.8% students had duration of bleeding of less than 3 days while maximum 75 % had normal duration of bleeding of 3-6 days. A 13.2% had duration of bleeding of more than 6 days while 2 (1.0%) students reported to have bleeding for more than 10 days in last three cycles.

In the present study, a majority (57.8%) of the students were in the normal weight range. A 5.9% of the students were overweight/obese (Table 2). Chi square test was applied to test the association of dysmenorrhea with body mass index among the participants. It was found that high percentage (83.3%) of students who were overweight/obese were reportedly suffering from dysmenorrhea. Whereas a lesser percentage underweight (40.5%) and normal weight (59.3%) students were reportedly suffering from dysmenorrhea. This association was found to be statistically significant. (Table 3)

Table 1: Menstrual cycle characteristics among the participants

Menstrual cycle characteristics	No of students (n)	Percentage (%)
Menstrual interval		
<21 days	6	3
21-35 days	157	77
>35 days	27	13
Irregular	14	7
Total	204	100
Duration of bleeding		
<3	22	10.8
3-6	153	75.0
>6	27	13.2
>10	2	1.0
Total	204	100

Table 2: The distribution of the participant students according to their BMI

BMI (Kg/mt^2)	Number of students (N=204)	Percentage (%)
<18.5	74	36.3
18.5 – 24.99	118	57.8
≥25	12	5.9
Total	204	100

Table 3: Association of BMI with dysmenorrhea

BMI (Kg/mt^2)	Dysmenorrhea present n (%)	Dysmenorrhea absent n (%)	Total n (%)
<18.5	30 (40.5%)	44 (59.5%)	74 (100.0%)
18.5 – 24.99	70 (59.3%)	48 (40.7%)	118 (100.0%)
≥25	10 (83.3%)	2 (16.7%)	12 (100.0%)
Total	110 (53.9%)	90 (40.2%)	204 (94.1%)

Chi sq value: 10.8958 p: 0.0043

Discussion

Menstruation is the cyclic, orderly sloughing of the uterine lining, in response to the interactions of hormones produced by the hypothalamus, pituitary, and ovaries.

Menstruation is normal physiological process wherein cyclical and regular shedding of uterine endometrium occurs regulated by the positive and negative feedback mechanism of hormones secreted by hypothalamus, pituitary and ovaries.[3,17] The regularity, duration and amount of menstrual bleeding are essential indicators of sexual development in females and they also help to rule out pathological conditions such as PCOD and other edocrinological disorders among young females.[16] Menstrual abnormality has become a common complaint among young females starting right from late adolescence amongst nearly 75% of them.[17]

Menstrual disorders are menstrual irregularities either in duration or length such as hyper- or-hypomenorrhea, poly or oligomenorrhea, amenorrhea, menorrhagia, dysmenorrhea and PMS.[18] In the present study, irregular cycles were seen in 7% students (Table 1) which is lower than in study done by Dambhare DG et al among adolescent girls.[19] This could be because our study was done in the age group of 18-25 years. By that time, body gets adjusted to the hormonal changes of puberty.[20] Less prevalence of overweight/obesity (5.9%) might be the reason for low incidence of menstrual irregularities and PCOD in our study group (Table 2)

In the present study, it was found that the length of the menstrual interval was normal i.e. 21-35 days in 77% of the students (Table 1) which is comparable to study done by Gayatri G et al.[4] The mean duration of menstrual flow in our study was 4 days which is similar to the studies conducted by Dambhare DG et al and Nusrat N et al.[19,21]

In the present study, the age at attainment of menarche was reported to be at less than 16 years of age among all participants and hence none of them had primary amenorrhoea. None were morbidly obese. And 3 out of 204(1.5%) students had been diagnosed with PCOD according to ultrasonic evidence of PCOD in our study. The results are comparable with the study conducted by Nidhi R et al, whereas the study conducted by Kural M et al documented a higher prevalence of PCOD (22%) which, according to the author was due to the use of different diagnostic criteria, study settings and age group of the sample studied.[6,22] Less prevalence of obesity found in our study group, might be one the reasons for lower incidence of menstrual irregularities and PCOD.[23]

In the present study, dysmenorrhoea was seen in a total of 53.9% of students. The study also showed a significant association of dysmenorrhea with overweight/obesity (Table 2 and 3). Similar results are found in the study conducted by Chakrabarti M et al.[24] Obesity is seen to be having close association with menstrual disturbances, dysmenorrhoea and PCOD. And it is seen that even average diet modification and physical exercise is associated with marked improvement in metabolic and endocrine functions.[25] Rising trends in the prevalence of PCOS has become a great cause for health concern as it is increasing the incidence of metabolic syndrome.[26]

Conclusion

Lack of exercise and sedentary lifestyle in young adults are increasing the incidence of menstrual abnormalities and PCOD, which ultimately increases the risk of metabolic syndrome. Early diagnosis and management of dysmenorrhea should be done and appropriate necessary life style modification should be encouraged among young females to reduce the incidence of PCOD and metabolic syndrome later in life.

Conflict of Interest: None.

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