ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

"ASSOCIATION BETWEEN BODY MASS INDEX AND PRIMARY DYSMENORRHEA"

KEY WORDS: Dysmenorrhea , Body mass index , Visual analog scale

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ABSTRACT

Introduction: Primary Dysmenorrhea is defined as severe cramping pain in the lower abdomen occurring just before or during menstruation in the absence of any pelvic pathology. It has a major impact on quality of life, social and occupational roles in females. The aim of our study was to find out an association between BMI and dysmenorrhea among medical students. **Methods:** The study was conducted on 200 medical students of RAMA medical college from June 2023 to December 2023 .Each one was supplied with questionnaire with detailed menstrual history, family history of dysmenorrhea. Pelvic sonography was performed to rule out any pelvic pathology. BMI was calculated by the formula weight in kg/height^2 in meter. Students were classified into four groups underweight, normal, overweight and obese groups based on the BMI criteria by WHO. The pain severity was assessed by visual analog scale (VAS). The data were statistically analysed by pearson chi- square test and $p<0.5$ was considered significant. **Result:** From our study , we found that there is positive correlation between primary dysmenorrhea and low BMI. The VAS of dysmenorrhea was higher in underweight group as compared to other groups. **Conclusion:** Low BMI is positively associated with primary dysmenorrhea.

INTRODUCTION

Dysmenorrhea is one of the most common health problems in young adolescent girls as it affects 50-90% of the general population [1]. Dysmenorrhea refers to a cyclical lower abdominal or pelvic pain usually radiating to the back or the thighs, occurring during menstruation. The actual word dysmenorrhea is derived from the Greek words, "dys" meaning difficult, "meno" meaning month, and "rrhea" meaning flow. Menstrual pain usually starts a day or 2 days before the menstrual flow and tends to cease after 1 or 2 days of menstruation [3]. Dysmenorrhea might also be accompanied by nausea, malaise, low back pain, or flank pain[4]

Dysmenorrhea is one of the leading causes of repeated absenteeism in girls from schools and colleges. Data from various studies conducted earlier show that absenteeism from school due to primary dysmenorrhea is 34-50% [5,6] .It is divided into primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is defined as cramping pain in the lower abdomen occurring at the onset of menstruation in the absence of any identifiable pelvic disease. It is differentiated from secondary dysmenorrhea, which refers to painful menses resulting from an identifiable pelvic pathology like fibroid, adenomyosis, pelvic inflammatory disease etc.

The etiology of primary dysmenorrhea is not precisely understood, but most symptoms can be explained by the action of prostaglandins, particularly PGF2alpha which is released during endometrial sloughing. As menstruation begins, PGF2alpha stimulates myometrial contractions, ischemia, and sensitization of nerve endings. The clinical evidence of this theory is quite strong. Women with more severe dysmenorrhea have higher levels of PGF2alpha in their menstrual fluid. In addition, several studies have demonstrated the impressive efficacy of NSAIDS, which act through prostaglandins synthetase inhibition. Some studies have also implicated increased levels of leukotrienes and vasopressin, but these connections are not well established[1–6].

Primary dysmenorrhea usually presents during adolescence within 3 years of menarche. It is unusual for symptoms to start within the first 6 months after menarche. A focused history and physical examination is usually sufficient to make the diagnosis of primary dysmenorrhea. History reveals the typical cramping pain and physical examination is completely normal. There are various reports regarding the impact of body mass index (BMI) on dysmenorrhea[9,10]

Body mass index or quetelet index is a statistical measure which compares a person's height and weight. Due to its ease of calculation, BMI is the most widely used diagnostic tool to identify obesity problems within a population. BMI is defined as the individual's bodyweight divided by the square of his height. BMI does not take into account many factors like frame size, muscularity, fat, bone, cartilage, water weight etc. Despite this, BMI can be calculated quickly and without expensive instruments. Hence, it has been used by the WHO as the standard for recording obesity statistics since 1980s. The WHO considers BMI < 18.5 as underweight while a BMI > 25 is considered overweight. Normal BMI ranges from 18.5 to 25. Severely underweight (starvation) is BMI < 16.5. Obese Class 1 is BMI between 30 and 35, Obese Class 2 is BMI between 35 and 40, and Obese Class 3 is BMI > 40.

Primary dysmenorrhea is by far the most common gynecological problem in menstruating women. It is so common that many fail to report it, even when their daily activities become restricted because they consider pain to be a normal part of the menstrual cycle. The consequences of untreated dysmenorrhea range from loss of work and school absenteeism to family and personal disruption. In a study done, dysmenorrhea accounted for 600 million work hours lost and $2 billion lost in productivity annually [7, 8]. Therefore, dysmenorrhea affects not only the untreated person, but also their family, social, and national economics. Hence, it is necessary to clarify what factors are associated with menstrual pain in adolescents to assist in improving their quality of life.

Our work aims to study the association of BMI with primary dysmenorrhea.

MATERIALS AND METHODS

The study was conducted on 200 medical students of RAMA medical college from june 2023 to December 2023 . Their age

ranged from 19 to 25 years. Participation by subjects was strictly voluntary. Informed consent was taken from all the students before their participation in the study. Each one was supplied with questionnaire with detailed menstrual history , family history of dysmenorrhea . Pelvic sonography was performed to rule out any pelvic pathology. A detailed history was taken in the form of a self-administered questionnaire, regarding socio-demographic factors, dietary history, menstrual history, past history, and family history. Pain intensity was measured using numeric pain scale and daily activities using daily activities questionnaire Intensity of pain was assessed by the Multidimensional Scoring System of Andersch and Milsom[10] (1982) which defines pain as follows:

1. Mild dysmenorrhea is defined as painful menstruation with no limitation of normal activity, with infrequent requirement of analgesics and no systemic complaints.
2. Moderate dysmenorrhea is defined as menstrual pain affecting daily activities, with requirement of analgesics for pain relief and few systemic complaints.
3. Severe dysmenorrhea is defined as menstrual pain with severe limitation of daily activities, poor response to analgesics, and apparent systemic complaints like vomiting, fainting etc.

General physical examination was performed. Height was recorded by the stadiometer in centimeters (converted to meters) as per ICMR guidelines 1957, maintaining an accuracy of 0.5 cm. The weight was measured using a balanced beam scale, wearing light clothes and no shoes, up to the nearest 100 gm. BMI was calculated by the formula weight in kg/height2 in meter . Students were classified into four groups underweight , normal , overweight and obese groups based on the BMI criteria by WHO Data obtained were statistically analyzed by Pearson Chi-square test, and p <0.5 was considered significant. Exclusion criteria were: Refusal for participation in the study H/O polycystic ovarian diseases Pelvic inflammatory diseases Ovarian volume >10 cc

RESULT

In our study, 200 female medical students were included to evaluate the relationship between BMI and dysmenorrhea and its impact on their daily activities. In our study, out of the 200 students studied, dysmenorrhea was present in 152 students and absent in the rest 48 students as shown in Fig. 1

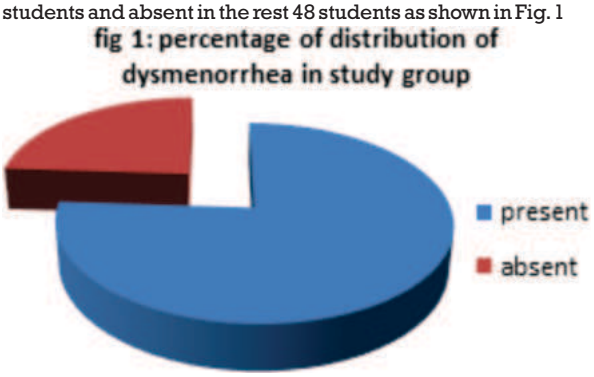

Fig. 2 shows that 36%, 45%, and 19% patients were suffering from mild (Grade I), moderate (Grade II), and severe dysmenorrhea (Grade III), respectively

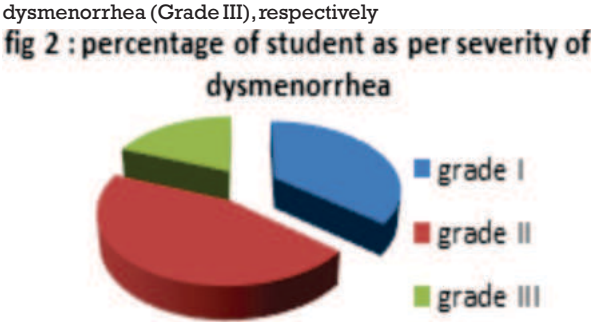

Fig 3 shows that 8 % miss school and 27 % limit normal activities due to dysmenorrhea.

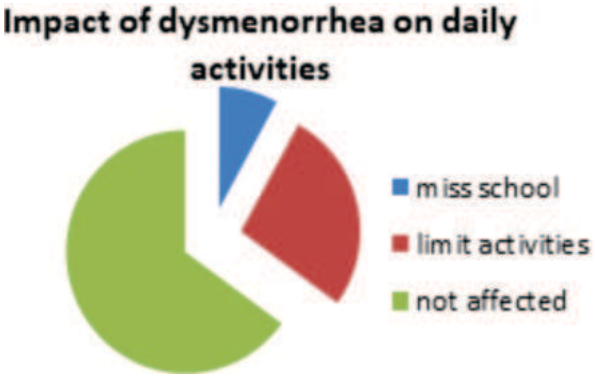

Table1 shows the relation between BMI and dysmenorrhea. It shows that the percentage of students having mild and moderate dysmenorrhea is significantly higher in students having low BMI (underweight students) as compared to overweight and obese students.

Table 1 : Relationship Between Dysmenorrhea & BMI.

BMI in kg/m2	Mild dysmenorrhea n = 72	Moderate dysmenorrhea n = 90	Severe dysmenorrhea n = 38
<18 kg/m2 (underweight)	18%	70%	76%
18 – 24.9 kg/m2 (normal weight)	32%	22%	18%
25 – 25.9 kg/m2 (overweight)	46%	8%	6%
>30 kg/m2 (obese)	4%	0%	0%

DISCUSSION

Menstruation is a natural phenomenon in women after puberty and is often associated with dysmenorrhea. Earlier studies have demonstrated an association between BMI and the incidence and severity of dysmenorrhea. Dysmenorrhea usually develops within hours of the beginning of menstruation and increases as flow becomes maximum during 1st or 2nd day. The etiology and pathophysiology of primary dysmenorrhea are not fully known, but most symptoms are by the action of uterine prostaglandins (PG), particularly PGF2 , which are released from the disintegrated endometrial cells as menstruation begins. The PGF2 stimulates myometrial contractions, ischemia, and sensitization of nerve endings. The evidence of this theory is that women with more severe dysmenorrhea have higher levels of PGF2 in their menstrual blood.

Some studies have also shown the possible increased levels of leukotrienes and vasopressin [12,13]. There is also the presence of positive family history in case of dysmenorrhea. Several studies have shown increased prevalence of dysmenorrhea in low BMI group [14,15]. Low caloric intake, body weight, and fat mass disturb pulsatile secretion of pituitary gonadotrophins leading to an increase in rate of dysmenorrhea. A longitudinal study by Ju et al. states that a U-shaped association between dysmenorrhea and BMI, revealing increased prevalence in both underweight and overweight females [16]. However, in our study, there was no increased association of the same in the overweight female students (Table 1).

We observed that dysmenorrhea had its impact on the daily activities of girls leading to school absenteeism and inability to pursue routine activities and hobbies, though our values were not statistically significant. Our study corroborates the study of Svanberg and Ulmstem [11], who observed that 9 % miss school and 25 % limit normal activities due to dysmenorrhea. In our study, the relation between dysmenorrhea and BMI was found to be highly significant (p < 0.001) with increased prevalence of dysmenorrhea in the low

BMI group. Our results are supported by the study of Hirata et al. [14], who found the frequency of dysmenorrhea to be greatest in the underweight group. Similarly, the study by Tangchai et al. [15] found low BMI to be significantly associated with dysmenorrhea..Montero et al. [17] found that attempting to lose weight was significantly associated with dysmenorrhea, but their findings were independent of BMI.

CONCLUSION

The prevalence of dysmenorrhea in adolescent girls is very high, resulting in disruption of their social and personal activities. Also, Indian adolescents have a very poor nutritional status, as reflected by their low BMI. Our study establishes a positive correlation between dysmenorrhea in adolescents and low BMI reflecting their poor dietary intake. Hence, improvement of their BMI by ensuring intake of a healthy and balanced diet may go a long way in relieving our young adolescent girls of dysmenorrhea and enable them to mature into more socially and economically productive members of the society.

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