Evaluation of relation between dysmenorrhea and body mass index in rural adolescents girls and its impact on quality of life

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Abstract

Objective: To evaluate relation between dysmenorrhea and body mass index and its impact on health-related quality of life (HRQoL). **Method:** Study was conducted in rural area at Kamineni Institute of Medical Sciences, Narketpally. Thorough menstrual history was taken from 100 adolescent patients with dysmenorrhea. Severity of dysmenorrhea was detected by verbal multi-dimensional scoring. Body mass index was calculated. Their absenteeism from school or class were assessed. SF-36 scale was used to determinate HRQoL. **Results:** In present study, 38%, 44% and 18% patients were suffering from mild, moderate and severe dysmenorrhea. Majority of girls (51%) were severly underweight having BMI <16.5kg/m^2, 26 % underweight. This indicates poor nutritional status of Indian adolescent girls, in rural setup. Majority of girls with moderate and severe dysmenorrhea had BMI <16.5Kg/m^2 which was significant (p <0.05). 30% patients had symptoms severe enough to be absent from school and 31% from classes. 18% patients reported social withdrawal. Scores received from many of SF-36 domains (physical functioning, role–physical, bodily pain, general health perception, vitality and social functioning) were significantly low. Also, with increasing severity of dysmenorrhea, scores were decreasing in these domains. **Conclusion:** Dysmenorrhea is important public health problem. It has negative effects on day today activities and health-related quality of life. There is a positive correlation between dysmenorrhea and low BMI. Present study was conducted for betterment of society for creating awareness of diet and health education to assist in improving quality of life.
Key Words: Body Mass Index (BMI) , Dysmenorrhea , Health-Related Quality of life (HRQoL) , School absenteeism

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INTRODUCTION

Menstrual abnormalities are common gynecological disorders among 75% of female adolescents[1], Out of which most common presentation is dysmenorrhea in 60% to 93%[2]. It is so common that many fail to report it, even when their daily activities become restricted because they consider it to be a normal part of the menstrual cycle. The word dysmenorrhea is derived from Greek words, "dys" meaning difficult, "meno" meaning month and "rrhea" meaning flow ie difficult, monthly, flow. It is classified into two types: Primary dysmenorrhea and Secondary dysmenorrhea. Primary dysmenorrhea is defined as painful menstruation with normal pelvic anatomy, usually begins during adolescence[3]. Patients experiences sharp, intermittent spasmodic pain usually confined to suprapubic area. It may radiate to back or legs. In severe grades it is associated with systemic symptoms like nausea, vomiting, giddiness etc. While, secondary dysmenorrhea is defined as painful menstruation with pelvic pathology. Dysmenorrhea is one

of the leading cause of repeated absenteeism in girls from schools and work .Thus it affects their academic performance, social and sports activities[4]. Several studies have shown that absenteeism from school due to primary dysmenorrhea is 34-50%[5,6]. It accounted for 600 million work hours loss and $2 billion loss in productivity annually[7]. Thus, it affects not only the untreated person, but also their family, social and national economics. Hence, it is necessary to clarify factors associated with dysmenorrhea in adolescents to assist in improving their quality of life. Through present study we are trying to evaluate, relation between dysmenorrhea and body mass index and its effect on quality of life among rural adolescents girls.

MATERIAL AND METHODS

Present study was conducted in Kamineni Institute of Medical Sciences, Narketpally, Nalgonda District, Telangana by Department of Physiology in collaboration with Department of Obstetrics and Gynecology after taking approval from ethical committee. It was a prospective study conducted on 100 patients during the period of July 2014 to December 2014.

Inclusion Criteria
- ✓ Patients with c/o dysmenorrhea between 11-17 years who have attained menarche at least 6 months back.

Exclusion Criteria
- ❖ Refusal for participation in study
- ❖ H/O polycystic ovarian diseases
- ❖ Pelvic inflammatory diseases
- ❖ Ovarian volume >10cc

All patients and parents were informed in detail about aim, objectives of the study and written consent was taken. The participation was purely on voluntary basis.
A detailed history was taken regarding socio-demographic factors, diet, menstrual cycle, past and family history.
In present study, dysmenorrhea was defined as having painful menstruation during the previous three cycles. Though pain is extremely subjective and very difficult to quantify; Researchers have, device many scoring systems.

We followed Verbal Multidimensional Scoring System[8] 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 painful menstruation affecting daily activities, with requirement of analgesics and few systemic complaints.
3. Severe dysmenorrhea is defined as painful menstruation with severe limitation of daily activities, poor response to analgesics and associated systemic complaints like vomiting, fainting etc.

Thorough general physical examination was done. Height was recorded, maintaining an accuracy of 0.5cm. Weight was measured, up to nearest 100gm. Body mass index or Quetelet index was calculated as weight in kilograms/height in square meters. Though BMI does not take into account many factors like muscularity, fat, bone, cartilage, water weight etc. ; due to its ease of calculation, it is still widely used. According to WHO, Normal BMI ranges from 18.5 to 25kg/m2. $BMI < 18.5 kg/m^2$ is underweight. $BMI < 16.5 kg/m^2$ is severely underweight while a $BMI > 25$ kg/m^2 is considered overweight. Systemic, Per abdominal examination and trans-abdominal ultrasound was done Those with pelvic pathology and ovarian volume >10cc were excluded. We studied impact of dysmenorrhoea on daily activities like attending school and their social involvement. School absence was defined as missing a half to complete day of school and class absence was defined as missing individual classes[4]. We also calculated quality of health using SF6 Scale. It is the most widely used self-evaluation scale for rating Health-Related Quality of life (HRQoL)[9,10] consisting of 36 items which provide assessment in following eight domains: physical functioning, limitations due to physical problems, bodily pain, general health perception , vitality, social functioning, limitations due to emotional problems , mental health. Scores was given from 0 to 100 for each domain separately.

Physical functioning: It indicates their perception of quality of life which is influenced by their physical condition.
Physical roles limitation (Role physical): It refers to extent to which daily activities is impeded by their physical state of health.
Bodily pain: It refers to extent to which daily activities is impeded by body pain.
General health perception is measured in terms of concepts such as excellent, very good, good, fair or poor, getting ill easier than other people or as healthy as others.
Vitality relates to experience of feeling energetic or worn out and tired.
Social functioning: It refers to social activities and interaction with others such as family members, friends, neighbours.
Emotional roles limitation (Role emotional): It refers to extent to which daily activities is impeded by emotional

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conditions e.g. feeling depressed or anxious, limits her daily functioning.

Mental health dimension is measured by their feeling happy, calm and peaceful, very nervous.

Statistical Analysis The data collected was tabulated in microsoft excel spread sheet. They were analysed and compared using Chi square test , F test. 'p' value less than 0.05 was considered as significant.

OBSERVATIONS AND RESULTS

Mean age of menarche was 12.54 ± 1.5 years. In 5% of patients , length of cycle was <20days, in 84% it was between 20-30 days and in 11% it was >35days. 22% patients reported abnormal blood loss per cycle (17 % had <30 ml and 5% had >100 ml) while 78% had blood loss between 30-100ml. 87% of patients had peak pain in first 24 hours. While 9% perceived between 24-72 hours and 4% perceived after 72 hours.

Table 1: Grades of Dysmenorrhea

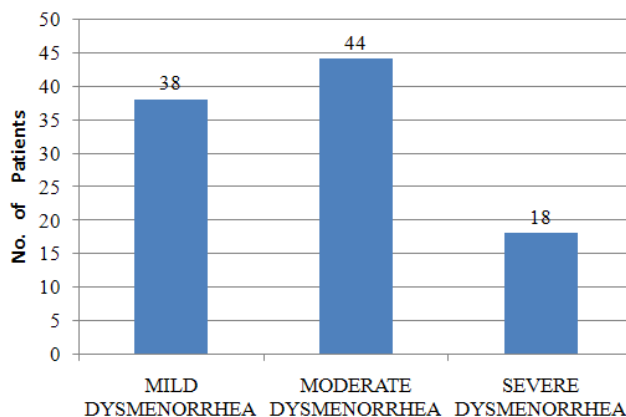| S.No	Grade	Number of patients (N=100)
1	Grade 1 (Mild)	38(38%)
2	Grade 2 (Moderate)	44(44%)
3	Grade 3 (Severe)	18(18%)

Figure 1: Distribution of grades Dysmenorrhea

Table 2: Presence of Associated Symptoms in Dysmenorrhea

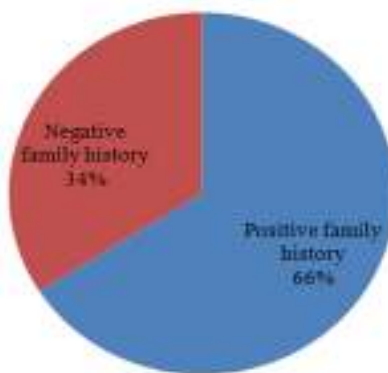| S.No	Associated symptoms	Number of patients
1	Nausea/vomiting	9(9%)
2	Giddiness	7(7%)
3	Headache	5(5%)
4	Diarrhoea	2(2%)

Figure 2: Association of Dysmenorrhea with Family history

Table 3: Distribution of Body Mass Index (BMI)

S.No	BMI(Kg/m^2)	Number of patients (N=100)
1	<16.5	51(51%)
2	16.5 – 18.5	26(26%)
3	18.5 – 25	21(21%)
4	>25	2(2%)

Table 4: Relation between grades of Dysmenorrhea and BMI

S.No	BMI(Kg/m^2)	Mild (n=38)	Moderate(n=44)	Severe (n=18)
1	<16.5	6(16%)	31*(70 %)	14*(78%)
2	16.5 – 18.5	13(34%)	10(23%)	3(17%)
3	18.5 – 25	17(45%)	3(7%)	1(5%)
4	>25	2(5%)	0	0

*p value <0.05

Table 5: Relation between dysmenorrhea and its impact on daily activities

S.No	Impact on daily activities	Number of patients (N=100)
1	No impact	21(21%)
2	Class absenteeism	31(31%)
3	School absenteeism	30(30%)
4	Social withdrawal	18(18%)

Table 6: Correlation between Severity of dysmenorrhea and mean scores of SF-36 domains

S.No	SF-36 Domains	Mild dysmenorrhea (n = 38) (mean ± SD)	Moderate dysmenorrhea (n = 44) (mean ± SD)	Severe dysmenorrhea (n = 18) (mean ± SD)	F test; p value
1	Physical functioning	81.70 ± 13.68	77.43 ± 15.22	76.97 ± 17.18	2.830; 0.040*
2	Role physical	82.15 ± 24.53	72.32 ± 31.45	68.51 ± 36.19	9.53; 0.001*
3	Bodily pain	67.05 ± 16.46	61.33 ± 15.61	53.61 ± 18.71	13.76; 0.001*
4	General health perception	58.03 ± 15.91	54.24 ± 16.81	51.43 ± 17.21	5.001; 0.012*
5	Vitality	54.12 ± 13.76	49.42 ± 16.72	48.01 ± 15.35	6.97; 0.001*
6	Social functioning	71.80 ± 19.14	65.58 ± 20.45	64.10 ± 20.22	4.145; 0.019*
7	Role emotional	57.42 ± 39.70	47.37 ± 41.33	53.25 ± 39.55	2.347; 0.102
8	Mental health	58.51 ± 14.98	54.67 ± 15.99	55.83 ± 17.62	4.289; 0.06

*p value <0.05

DISCUSSION

In present study, 100 cases having primary dysmenorrhea were included. Our aim was to evaluate relationship between dysmenorrhea and BMI and its impact on Health-Related Quality of life. The mean age of menarche is similar to other studies [11,12]. Majority (87%) of patients had pain in first 24 hours. It usually develops within hours of begining of menstruation and peaks as flow becomes maximum during first or second day [7]. 38%, 44% and 18% patients were suffering from mild, moderate and severe dysmenorrhea (Table 1, Figure 1), which is similar to Jerry et al[13](49% mild, 38% moderate and 14% severe dysmenorrhea respectively). while study by Amit Singh et al[14] showed incidence of grade 0- 26%, grade 1- 48%, grade 2- 22% and grade 3- 4% while study by Madhubala Chouhan[15] showed grade 0 18.5%, 52 % had mild, 26.5 % had moderate and 3 % had severe dysmenorrhea. A reason for variation in these estimates may be due to different groups of women and absence of a universally accepted method of defining dysmenorrhea. The etiology of primary dysmenorrhea is not precisely understood, but most symptoms can be explained by action of uterine prostaglandins, particularly PGF2α. As menstruation begins the disintegrating endometrial cells release PGF2α. It 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 PGF2α in their menstrual blood. 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[16,17]. Associated symptoms (Table 2) among these patients are similar to study conducted by Gulsen Eryilmaz et al[11] and Maitre Shah et al [18] The presence of dysmenorrhoea in mother or sister was considered as positive family history. In present study, (Figure 2) Family history seems to be a risk factor for dysmenorrhoea. The results are consistent with previous studies[19,20]. Possible reason for this could be related to behavior that is learned from mother[21]. It may also be

related to conditions which shows diseases with familial pattern such as endometriosis[22]. In present study (Table 3, Figure 3), majority (51%)of the girls were severly underweight, 26% underweight. This indicates poor nutritional status of Indian adolescent girls, in the rural setup. Our findings are in agreement with study by Chaturvedi et al.23 and Madhubala Chouhan[15] Majority of girls with moderate and severe dysmenorrhea had BMI $<16.5 Kg/m^2$ which was statistically significant (p <0.05) (Table 4, Figure 4). Thus there was increased prevalence of dysmenorrhea in low BMI group. Our results are in aggrement with study by Hirata et al.[24], Tangchai et al.[25] and Madhubala Chouhan[15]. Low caloric intake , low weight and low fat mass are speculated to disturb pulsatile secretion of pituitary gondotrophins leading to an increase in dysmenorrhea[26]. 30% patients had symptoms severe enough to be absent from school and 31% absent from classes (Table 5, Figure 5); Many studies have reported rate of school absenteeism ranging from 25 to 50%[4,6,8,14]. Because of inability to concentrate in class and study, inability to attend classes and tests missed because of absenteeism leads to poor academic performance. Also 18% patients reported social withdrawal from friends, gathering, sports during menses. Though it is not life threatening, it has a profound negative impact on day to day life. This indicates that dysmenorrhea is still an important public health problem[4,22,27]. In present study, scores received from following domains ie physical functioning, role-physical, bodily pain, general health perception, vitality and social functioning of SF-36 scale were significantly lower in patients (p<0.05)(Table 6). Dysmenorrhea primarily affects physical health domain. Psychological parameters such as, role- emotional and mental health are probably not affected . These findings are consistent with study by Barnard et al.[28] and Unsal et al[29].

CONCLUSION

Present study establishes a positive correlation between dysmenorrhea in adolescents and low BMI reflecting their poor dietary intake. Hence, intake of balanced diet will assist them in improving quality of life and enabling them to mature into more socially and economically productive members of the society. Dysmenorrhea has a negative effect on HRQoL. It is a leading cause of class / school absenteeism. As it is still an important public health problem, health education will play a major role. It demands some attention from policy makers and health care providers.

LIMITATIONS

Firstly, it was performed in a single hospital, therefore the sample may not be representative of all Indian adolescent.

Also nature of self-reporting may have resulted in underreporting.

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