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Dysmenorrhoea, its Associated Risk Factors and Management Amongst Adolescent Girls in Aligarh: A Cross-Sectional Study

Farha Tarannum[1], Hajera Rabbani[2], Syed Imran Ali[3]

[1]Associate professor, Department of Community Medicine, Mamata Academy of Medical Sciences, Bachupally, Hyderabad
[2]Associate professor, Department of Community Medicine, Mamata Academy of Medical Sciences, Bachupally, Hyderabad
[3]Associate professor, Department of Physiology, Mamata Academy of Medical Sciences, Bachupally, Hyderabad

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Corresponding Author:

Farha Tarannum
Associate professor, Department of Community Medicine, Mamata Academy of Medical Sciences, Bachupally, Hyderabad
Email: farha.amu88@gmail.com

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ABSTRACT

Background: Painful menstruation or dysmenorrhoea is considered the most common symptom of all menstrual complaints and poses a greater burden of disease than any other gynecological complaint in developing countries. It is defined as pelvic pain directly related to menstruation and is associated with various other symptoms.
Objective: The study aims to assess the prevalence of primary dysmenorrhoea, evaluate associated risk factors and self management techniques practiced among adolescent girls in Aligarh.
Method: A descriptive cross-sectional study in schools under Aligarh Muslim University, Aligarh was undertaken. A Self-administrated questionnaire was used to collect data on dysmenorrhoea and severity of pain was graded by Numerical pain rating scale. A total of 422 girls (class 6th to 12th) were taken by systematic random sampling with probability proportionate to size. Data was analyzed statistically by binary logistic regression. The predictor variables found significant were included in multivariate analysis using SPSS Version 20. RESULT: Of total 422 girls, 42.7% (180) reported dysmenorrhoea . Out of them 45% graded pain as moderate while 25% reported severe pain. Multivariate binary logistic regression indicated that low income, AOR (95%CI) 2.85(1.51-5.35), underweight , AOR (95% CI) 3.19(1.74-5.84), early menarche AOR (95%CI) 3.11(1.29-7.49), longer duration of menstruation (>5 days), AOR (95%CI) 3.37(1.19-6.49), heavy menstrual bleeding AOR (95% CI) 2.06(1.25-3.41) and irregular cycle, AOR (95% CI) 1.64(1.02-2.64) were associated risk factors of dysmenorrhoea. Out of various self management techniques, 25.1% opted medicine to get relief from pain while 22.3% did not take any measure.
Conclusion: The prevalence of primary dysmenorrhoea among adolescent girls in Aligarh is relatively high. Various risk factors were identified that are associated with primary dysmenorrhoea. Increasing the awareness and proper medical advice can help in relieving the burden of this common health problem.

Keywords: *dysmenorrhoea, risk factors, menstruation.*

INTRODUCTION

Menstruation marks an important milestone in women's reproductive and endocrine health. Although it is a natural phenomenon many girls face problems of menstruation such as irregular bleeding, excessive bleeding, and painful menstruation[1]. Painful menstruation or dysmenorrhea is a common gynecologic disorder among young females. It is defined as pelvic pain directly related to menstruation and is associated with various other symptoms. Dysmenorrhea is classified into two categories: primary when pelvic examination and ovulatory function are normal and secondary when there is an identifiable gynecological pathology. Primary dysmenorrhea characteristically begins when adolescents attain their ovulatory cycles; generally, within the 1st year after menarche[2,3].

Dysmenorrhea is considered the most common symptom of all menstrual complaints and poses a greater burden of disease than any other gynecological complaint in developing countries[4]. Pain or cramping sensations in the lower abdomen may be accompanied by headaches, dizziness, diarrhea, a bloated feeling, nausea and vomiting, backache, and leg pains[5,6]. The high prevalence of dysmenorrhea among adolescents (50%–70%)[6,7,8], especially in the 1st year of their reproductive life influences their daily activities,[1,5,9,10] and is thus a major public health problem[7,8].

Although menstrual irregularity can be normal during the first few years after menarche, other menstrual signs and symptoms such as amenorrhea, excessive uterine bleeding, dysmenorrheal, and premenstrual syndrome may indicate a pathological condition which requires prompt attention and referral[7].

Despite being the common gynaecological problem, there are limited studies in and around Aligarh. It's unclear to what extent young girls are bearing severity of dysmenorrhoea. Hence this study is done to estimate the magnitude of dysmenorrhoea.

AIMS & OBJECTIVES:

The study aims to assess the prevalence of primary dysmenorrhoea, evaluate associated risk factors and self-management techniques practiced among adolescent girls in Aligarh.

MATERIAL AND METHODS:

The present study was a Community based Cross-Sectional study conducted in Secondary and higher Secondary Schools (Girls) of Aligarh Muslim University (AMU), Aligarh. The study was conducted among the students of class 6th to 12thstandard from each of the university girl schools namely Senior Secondary School Girls, AMU Girls High School and AMU ABK High School (Girls) using systematic random sampling with population proportionate to size.

The sample size was calculated by using the single population proportion formula with the assumptions of 95% confidence interval (CI), 5% margin of error, the anticipated prevalance 50%[11], and 10% non response rate. Based on this, our final calculated sample size was 420. For the selection of 422 students, the Population proportionate to size technique was used to calculate the required sample from each of the school and respective classes. Out of total of 422, 97 girls were taken from Senior Secondary school girls, 200 from AMU Girls High school and 125 from AMU ABK High school Girls. In different classes, every 8th (sampling interval) student was taken. In case that student was absent then the next one was taken.

All students studying in class 6th to 12th standard from the selected schools and had attained menarche as well as a student who gave consent were included in study whereas students who were absent on the day of data collection were excluded from the study.

A pre-designed and pretested questionnaire was used for data collection in a face to face interview. Weight and height was used to calculate Body mass index (BMI) using formula BMI = weight in Kg/height in m2. BMI was classified into four groups based on the cut off points recommended by World Health Organization[12]. Pattern of menstruation was assessed by length of menstrual cycle and duration of menstruation. Cycle with an average rhythm of 28±7 days and 3-6 days of bleeding is a regular menstruation[13]. Pictorial blood assessment chart was used to assess heavy menstrual bleeding[14]. Numerical Pain Rating Scale was used in the study to grade intensity of pain in dysmenorrhoea[15]. It is developed by Mc Caffery M, Pasero C. It is an 11-point scale for self-reporting of pain consisting of vertical or horizontal line that is anchored by number 0 on the bottom or left side and number 10 on the top or the right side. 0 indicates no pain and 10 indicates worst pain imaginable.

Data were entered and analyzed using (IBM SPSS version 20 Armonk, NY) Descriptive statistics such as frequency and percentages for categorical variables were used. Both bivariate and multivariable logistic regression analyses (backward stepwise) were used to determine factors associated with premenstrual syndrome. $P \leq 0.05$ was considered statistically significant

The study was approved by Institutional Ethics Committee, JNMCH, AMU, Aligarh. In addition written informed consent from the participating schools and informed oral assent was taken from all the participants, after explaining the purpose of the study and prior consent from parents was taken.

RESULT:

Table 1 shows the socio-demographic details of study subjects. Majority of the respondents, (54.0%), were aged between 10-14 years, while remaining in the age range of 15-19 years (46.0%). Nearly one-third of the respondents were students of class 6th to 8th (33.6%) while the remaining students were studying in 9th -10th (41.5%) and 11th -10th (24.9%). Almost two-fifth of respondents, mother (41.2%) had completed graduation while 29.1% of respondents mother were educated till high school. 75% of the mother were housewife while 25% were working. Again two-fourth of respondents father(41.2%) had completed graduation. Majority of respondents father (39.3%) belong to service class. Majority of study participants were in the normal BMI range (53.1%) while one-fourth of population i.e. 113 (26.8%) were underweight as per WHO Classification.

Table 1: Background characteristics of study population:

Background characteristic	n(%)
AGE (years)	
10-14	228(54.0)
15-19	194(46.0)
EDUCATION STATUS OF STUDY SUBJECT	
Class 6^{th} – 8^{th}	142(33.6)
Class 9^{th} -10^{th}	175(41.5)
Class 11^{th} -12^{th}	105(24.9)
EDUCATION STATUS OF MOTHER	
High school	123(29.1)
Above High school	125(29.6)
Graduate and above	174(41.2)
OCCUPATION OF MOTHER	
Housewife	317(75.1)
Working	105(24.9)
EDUCATION STATUS OF FATHER	
High school	60(14.2)
Above high school	112(26.5)
Graduate and above	174(41.2)
OCCUPATION OF FATHER	
Professional	56(13.3)
Service	166(39.3)
Business	96(22.7)
Others	104(24.6)
MONTHLY INCOME	
Less than 10,000	104(24.7)
10,000-19,999	113(26.8)
20,000-29,999	100(23.7)
30,000 and above	105(24.8)
BODY MASS INDEX	
Normal	224(53.1)
Underweight	113(26.8)
Overweight/obese	85(20.1)

Table 2: Menstruation related Information

VARIABLES	N(%)
AGE OF MENARCHE (years)	
<12	154(36.5)
12-14	235(55.7)
>14	33(7.8)
CYCLE LENGTH (days)	
<21	63(14.9)
21-35	240(56.9)
>35	119(28.2)
DURATION OF MENSTRUATION (days)	
<3	37(8.8)
3-5	259(61.4)
>5	126(29.9)
REGULARITY OF CYCLE	
Regular	237(56.2)
irregular	185(43.8)
AMOUNT OF BLEEDING	
Scarce	89(21.1)
Average	191(45.3)
Heavy	142(33.6)

Table 3: Distribution of adolescent girls based on dysmenorrhoea characteristic

SAMPLE CHARACTERISTICS	FREQUENCY (n)	PERCENTAGE (%)

PRESENCE OF DYSMENORRHOEA		
Yes	180	42.7
No	242	57.3
Total	422	100
DAY OF MENSTRUATION WITH SEVERE PAIN		
One day before onset of menstruation	41	22.7
On first day	105	58.3
On second day	24	21.5
Any other day	10	13.3
Total	180	100
BODY PARTS HAVING PAIN		
Lower abdomen	45	25.0
Lower abdomen and back	50	27.8
Lower abdomen back and legs	60	33.3
Other body parts	25	13.9
Total	180	100
SEVERITY OF PAIN		
Mild	55	30.5
Moderate	80	44.5
Severe	45	25.0
Total	180	100
EFFECT ON DAILY ACTIVITY		
Yes	70	38.9
No	110	61.1
Total	180	100
EFFECT ON SLEEP		
Yes	62	34.4
No	118	65.6
Total	180	100
EFFECT ON ACADEMICS		
School absenteeism	26	14.4
Feeling weak and tired	80	44.5
Lack of concentration	58	32.2
No effect	16	8.9
Total	180	100

Table 4: Bivariate and multivariable analysis of risk factors associated with dysmenorrhea

RISK FACTORS	DYSMENORRHOEA		CRUDE OR (95%CI), p value	ADJUSTED OR (95%CI), p value
	YES	NO		
AGE				
10-14	92	136	1.00	
15-19	88	106	1.35(0.78-2.32), 0.27	
EDUCATION STATUS OF STUDY SUBJECT				
Class 6^{th} to 8^{th}	49	93	1.00	
Class 9^{th} to 10^{th}	80	95	1.74(0.81-3.74), 0.15	
Class 11^{th} to 12^{th}	51	54	0.91(0.48-1.73), 0.78	
EDUCATION STATUS OF FATHER				
High school	22	38	1.00	
Above high school	49	63	0.52(0.20-1.33),0.17	
Graduate and above	109	141	0.51(0.26-1.03),0.06	
EDUCATION STATUS OF MOTHER				
High school	45	78	1.00	
Above high school	51	74	1.74(0.81-3.72), 0.15	
Graduate and above	84	90	1.47(0.79–2.74), 0.21	
OCCUPATION OF MOTHER				
Housewife	128	189	1.00	
working	52	53	0.85(0.47-1.52), 0.58	
OCCUPATION OF FATHER				

Professional	23	33	1.00	
service	75	91	1.65(0.58-4.71), 0.34	
business	41	55	0.98(0.44-2.17), 0.96	
others	41	63	1.02(0.44-2.34), 0.95	
MONTHLY INCOME				
Less than 10,000	55	49	**3.45(1.61-7.40)*, <0.01**	**2.85(1.51-5.35)*, <0.01**
10,000-19,999	37	76	1.83(0.77-4.34) ,0.16	1.55(0.81-2.95) ,0.18
20,000-29,999	42	58	1.71(0.87-3.37), 0.11	1.44(0.77-2.69) 0.24
More than 30,000	46	59	1.00	1.00
BODY MASS INDEX				
Normal	68	156	1.00	1.00
underweight	58	55	**3.74(1.97-7.06)*, <0.01**	**3.19(1.74-5.84)*, <0.01**
Overweight/obese	54	31	1.68(0.83-3.39), 0.14	1.51(0.77-2.95), 0.22
AGE OF MENARCHE				
<12	81	73	**3.13(1.23-7.95)*, 0.01**	**3.11(1.29-7.49)*, 0.01**
12-14	77	158	1.00	1.00
>14	22	11	1.63(0.64-4.17),0.30	1.85(0.75-4.59),0.18
CYCLE LENGTH				
<21	35	28	0.49(0.25-0.96),0.05	
21-35	99	141	1.00	
>35	46	73	0.50(0.23-1.05),0.07	
DURATION OF MENSTRUATION				
<3	06	31	0.80(0.45-1.42), 0.45	0.83(0.49-1.41), 0.49
3-5	111	148	1.00	1.00
>5	63	63	**3.48(1.20-7.11)*, 0.02**	**3.37(1.19-6.49)*, 0.02**
REGULARITY OF CYCLE				
Regular	96	171	1.00	1.00
Irregular	84	71	**2.23(1.16-4.26)*,0.01**	**1.64(1.02-2.64)*, 0.03**
AMOUNT OF BLEEDING				
Scarce	39	50	0.97(0.49-1.95),0.95	**1.21(0.63-2.29), 0.55**
Average	63	128	1.00	**1.00**
Heavy	78	64	**2.34(1.38-3.97)*, <0.01**	**2.06(1.25-3.41)*, <0.01**

Table 5: Self- Management techniques to get pain relief

TYPE OF MEDICATION*	FREQUENCY(n)	PERCENTAGE(%)
Medicine	63	25.1
Hot application	46	18.3
Massage	25	10.0
Bed rest	124	51.0
No measures	56	22.3

***Multiple response**

As per table 2, more than one-third (36.5%) of the respondents experienced early menarche, before celebrating their 12th birthday. Out of the total study population, 63(14.9%) girls had a menstrual cycle length shorter than 21 days, 119 (28.2%)

had cycle longer than 35 days and 240(56.9%) had a cycle length between 21 and 35 days. Majority 259(50.9%) of the subjects experienced normal duration of bleeding (3-5 days), 37(8.8%) reported shorter duration of bleeding (<3 days) and 126(29.9%) had longer duration of bleeding (>5 days). It was observed that majority 237(56.2%) experienced regular cycle while 185(43.8%) reported irregular cycle. Nearly one-third (33.6%) of the participant reported heavy bleeding during menstruation.

In Table 3, information related with dysmenorrhoea is presented. Dysmenorrhoea was reported by 180 (42.7%) of the study population. Out of 180 girls who complained of dysmenorrhoea, 58.3% had most severe pain on first day, 21.5% on second day, 22.7% on one day before menstruation and 13.3% on any other day. Regarding location of pain, most of the girls (33.3%) were having lower abdomen, back and leg pain, 27.8% were having lower abdomen and back pain and 25% had pain in lower abdomen. As per numerical pain rating scale, 80(44.5%) girls reported moderate pain while 30.5% and 25% had mild and severe pain respectively. Dysmenorrhoea affected daily routine activities of 38.9% of the females and 34.4% complained of disturbance in sleep. Dysmenorrhoea affected academic performance of 91% of the students in various ways. Most of the girls (44.5%) felt weak and tired, 32.2% complained of lack of concentration, 14.4% girls preferred school absenteeism. 8.9% girls reported no effect on academics due to dysmenorrhea

During the multivariate analysis of Dysmenorrhoea in relation to all exploratory variables, only six of the most contributing factors remained to be statistically significant and independently associated with the presence of dysmenorrhoea (at 0.05 level of significance). In this study, the existence of dysmenorrhoea had a statistically significant association with low income, AOR (95%CI) 2.85(1.51-5.35), underweight , AOR (95% CI) 3.19(1.74-5.84), early menarche AOR (95%CI) 3.11(1.29-7.49), longer duration of menses (>5 days), AOR (95%CI) 3.37(1.19-6.49), heavy menstrual bleeding AOR (95% CI) 2.06(1.25-3.41) and irregular cycle, AOR (95% CI) 1.64(1.02-2.64) (Table 4). Cox and Snell R2 was 0.2 and Nagelkerke R2 was 0.3.

Of various self management techniques opted by study groups, 51% took bedrest, 18.3% opted for hot applications, 10% took help of massage, 25.1% opted medicine to get relief from pain while 22.3% did not take any measure as showed in table 5

DISCUSSION:

This study aimed to determine prevalence of dysmenorrhoea, risk factors contributing to dysmenorrhoea, pain severity and different management practices. This study has established certain risk factors associated with dysmenorrhoea.

The current study showed the prevalence of dysmenorrhoea was relatively high (42.7%) among school going adolescent girls of Aligarh. This result was in agreement with the 45% among young college nursing students in vadodara by shah et al[16], 46.8% by Rana et al[17] in Gujrat, 49.13% by Mohite et al[18] in Maharastra. Another cross-sectional study among chinese female university students in Hunan, China reported prevalence of 41.7%[19]. However, in our study population, the prevalence was lower than 78.2% in Mysore[20], 67.2% in Delhi[21], 85.1% in Ethiopia[22], 89.1% in Iran[23]. The variations of prevalence rates of dysmenorrhea across the world may be due to absence of a standardized definition of Dysmenorrhoea and objective assessment methods used to determine this condition, ethnic and sociocultural factors of study population.

More than two third of the girls (69.5%) described their dysmenorrhea as moderate to severe. Pain is extremely subjective symptom and it has been very difficult to quantify pain. In our study, it was revealed that 30.5%, 44.5% and 25% of girls had mild, moderate and severe pain, respectively. In a study conducted by Ortiz in 1539 students of Mexican University, author concluded that dysmenorrhea was mild in 36.1%, moderate in 43.8% and severe in 20.1%[24]. Maitri shah et al., have found that 18%, 40% and 42% of students had mild, moderate and severe pain respectively[25]. This indicates dysmenorrhea is still an important public health problem which may have a negative impact on health, social environment, academic performance and psychological status.

Primary dysmenorrhoea usually begins at either the first day of menstruation or the day before[26]. In our study majority of girls (58.3%) reported pain on first day of menses. As far as effect of pain on academics was concerned, majority complained of weakness and tiredness (44.5%) and lack of concentration (32.2%). The current finding was supported by an exploratory survey conducted by Anil K Agarwal[27] and a descriptive survey by George et al[28].

Our study showed that risk of dysmenorrhoea is more in low income group. This was consistent with other studies that have shown that socioeconomic status influences the severity of menstruation pain[29,30]. For instance, a study performed in 581 women aged 18-45 years in central North Carolina indicated that low income increased the development of dysmenorrhea and dyspareunia[31].

Another student among 440 female university students showed that the risk of PD was nearly 5 times higher among students whose monthly income was less than 9 USD than those whose monthly income was greater than 18 USD[32]. In contrast, a prospective study conducted in 823 enrolled Japanese women reported no distinct relationship between dysmenorrhea and household income[33]. The mixed results could be explained by the differences in the study population and different definitions of various economic situations and require further understanding.

According to our study girls with early menarche and irregular cycle are at risk of dysmenorrhoea. Chauhan et al in Karnataka reported a significant association between age of menarche and dysmenorrhoea[34]. Omidvar et al found that higher percentage of girls who encompassed menarche at an earlier age experienced dysmenorrhoea more than those who had late menarche[20]. However, Pawlowski et al did not find any difference in the ages of menarche between dysmenorrheic and non-dysmenorrheic girls[35]. A systematic review that included 63 studies and 64,286 women showed that earlier menarche and an irregular cycle increased the risk of dysmenorrhea by 54% and 102%, respectively[36]. Although the underlying etiologic mechanisms of these associations are not well understood, the mechanism is probably related to ovulatory efficiency, higher levels of uterine activity during menstruation, and the increased production of uterine PGs[37,38] Our study showed that adolescent girls who were underweight were associated with increased risk of dysmenorrhea compared with those who had a normal BMI. These results are compatible with other research findings [39,34]. A meta-analysis that included 5 trials showed that a BMI of less than 20 increased the risk for dysmenorrhea by 42%[36]. However, the association between BMI and Dysmenorrhoea is still controversial. Many studies have revealed no relationship between BMI and dysmenorrhea,[33,40] whereas other studies have shown an increased prevalence of PD in overweight or obese subjects[41,42]. Despite that the pathophysiological mechanisms are still unclear, a possible hypothesis is that a lower amount of body fat affects normal ovulation and menstrual cycles and thus leads to excessive release of prostaglandin (PGs) which results in dysmenorrhoea[43].

Menstrual bleeding duration of 5 days and over was an important risk factor for dysmenorrhoea. Bleeding duration was found to be significantly associated with dysmenorrhea in the present stud. This finding is compatible with the result showing that the risk of dysmenorrheal is higher in women with long menstrual flows[44,45].

CONCLUSION:

To conclude, dysmenorrhea is found to be highly prevalent among school going girls. Dysmenorrheal pain may affect the daily activities and academic performance of the students. Findings suggest low income, underweight, early menarche, long menstrual bleeding, irregular cycle and heavy menstrual bleeding as significant risk factors for dysmenorrhea in these girls. Majority of girls were suffering from dysmenorrhea indicating the magnitude of problem and thus, need an appropriate medical intervention and lifestyle modification.

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