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PRIMARY DYSMENORRHEA AND ASSOCIATED RISK FACTORS AMONG FEMALE ADOLESCENTS LIVING IN WEST BENGAL, INDIA

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ABSTRACT Primary dysmenorrhea is a gynecological problem of women in their reproductive age which adversely affect quality of life. This study was designed to determine the prevalence of dysmenorrhea and associated risk factors for incidence of primary dysmenorrhea among adolescent females. Further this study attempted to determine the factors associated with degree of primary dysmenorrhea. This is a cross sectional questionnaire based study conducted among 1646 adolescent female having age limit 14-19 years. Only unmarried adolescent females were included in the study however, females with gynecological, psychological or other medical problems were excluded from the study. We used Visual analogue scale (VAS) for pain rating. Socio-demographic, life style and behavior and menstrual characteristics were obtained through interviews with the help of pretested questionnaire. The descriptive data analysis, chi-square test and multivariate logistic regression analysis was done. The significance level of the tests were considered at a significance level of 0.05. Prevalence of dysmenorrhea was 88.94%. Among dysmenorrhea 22.40% was under severe category. There was no significant difference of prevalence of dysmenorrhea between Hindu and Muslim. Family history of dysmenorrhea strongly increase the risk of dysmenorrhea and its pain intensity. Among lifestyle characteristics skipping breakfast and frequency of junk food intake significantly increase the risk of dysmenorrhea and degree of menstrual pain. Among reproductive characteristics irregularity of menstrual cycle, bleeding duration and release of clot blood during menstruation are significantly associated with primary dysmenorrhea. In conclusion the results of our study suggested that primary dysmenorrhea is a significant for a large proportion of adolescent females. Positive family history of dysmenorrhea, Junk food intake, Skipping breakfast, irregular menstruation, release of clot blood during menstruation and duration of menstrual bleeding are significantly associated with risk of primary dysmenorrhea and its pain intensity.

KEYWORDS : Dysmenorrhea, BMI, skipping breakfast, junk food intake, menstrual irregularity, family history.

INTRODUCTION

Dysmenorrhea is a painful cramping sensation in the lower abdomen which may also radiate to the back and thighs. Such cramping sensation is accompanied by other symptoms including headache, sweating, nausea and vomiting. There are two category of dysmenorrhea viz. primary and secondary dysmenorrhea. Primary dysmenorrhea defines as menstrual pain without any pelvic pathology and usually happens within a year of menarche (1). Secondary dysmenorrhea refers to a menstrual pain caused by organic pelvic pathology such as endometriosis and arises later in life (2). It is the most common among all gynecological complaints.

Dysmenorrhea, disrupt the quality of life and social activities of young women (3). 3-33% women suffer in severe pain lasting for 1-3 days in each monthly menstrual cycle (4). Severe dysmenorrhea causes inability to function and absence from occupation (5). Dysmenorrhea has socioeconomic impacts because of the increased need of medical care and associated medical costs as well as decreased women's effectiveness in day-to-day tasks (6). Dysmenorrhea has negative impact on daily life, lower education performance at puberty, poor sleep quality and mood resulting in anxiety and depression (7).

The prevalence of dysmenorrhea varies across different countries from 16 to 91% (6, 8). Greater prevalence (67% to 90%) was observed in young women aged 17-24 years (9, 10). 93% of senior high school girls suffer in menstrual pain (8). Indian studies reported prevalence varying from 50% to 87.8% among adolescents (11, 12).

In literature survey a wide range of risk factors for dysmenorrhea have been identified with controversial findings. Severity of menstrual pain have been associated with age (13, 14), smoking (15), age of menarche (16) and menstrual flow (17 and stress (18). Negative or inconclusive results was reported for alcohol consumption (19), physical activity (16).

However, most of these data were international. The aim of this study was to confirm the association between severity of menstrual pain with demographic, life style and behavior and reproductive factors among unmarried adolescent female. This study explores the prevalence of dysmenorrhea and its associated risk factors.

MATERIAL & METHODS

Subject: A cross-sectional study was done in Hooghly district. The population was unmarried Bengali female adolescent students who were randomly selected from colleges and schools in the age group between 14 to 19 years. Willingness of the subject was considered. A total of 1646 female students were involved in the study. Students having age less than 14 years or more than 19 years, those who were taking regular drugs or hormonal therapy and suffering from chronic disorders including diabetes mellitus, clinically established hypertension, liver cirrhosis and kidney disease, suffering with secondary dysmenorrhea were excluded from the study.

Questionnaire:

A self-administered questionnaire having questions related to their age, menarche age, different life style factors & menstrual factors such as menarche age, duration of menses, regularity, pain etc. were applied. The questionnaires were translated to the local language (Bengali) as well.

Anthropometric measurement:

Anthropometric parameters like height, weight and mid upper arm circumference were determined according to standard method (20) and BMI was calculated.

VAS (Visual Analogue Scale):

The intensity of menstrual pain was assessed by using visual analogue scale (21). The visual analogue scale is a 100 mm long scale. VAS had been recommended: no pain (0-4mm), mild pain (5-44mm), moderate pain (45-74mm), and severe pain (75-100mm).All students are divided into four classes on the basis of scores obtained from VAS.

Statistical analysis: Quantitative data was presented as percentage and/or mean $\pm$ standard deviation. T-test was done to determine significant of difference between females with dysmenorrhea and without dysmenorrhea. Chi-square test was applied to determine significant of association between dysmenorrhea and study factors. Correlation coefficient (r) between dysmenorrhea and continuous factors were estimated. Also the predictive risk factors of dysmenorrhea were evaluated using multivariate logistic regression analysis. The significance level of the tests were considered at a significance level of 0.05.

RESULTS

Socio demographic characteristics: Initially 1698 students

participated in the study. 13 respondents withdraws their names due to shortage of time. 39 students excluded from the analysis due to incomplete answer in questionnaires. Thus actual participants was 1646.

Demographic characteristics of study population were given in table-1. Average age of participants was 15.91 ± 1.27 years ranging from 14 to 19 years. Anthropometric parameters like height and weight were determine and BMI was calculated. . Mean value of BMI was 21.02 ± 4.42 kg/m^2. 67% females coming from a family having previous history of dysmenorrhea. Most of the study population 1280 (77.76%) were Hindu and rest 366 (22.24 %) were Muslim. Most of the mothers of selected adolescents 1084 (65.86%) up to 10th grade in education standard.

Prevalence of dysmenorrhea:

Age wise prevalence of primary dysmenorrhea was represented in in table -2. As a whole 11% adolescent were non-dysmenorrhaic and rest are dysmenorrhic. Around 43% had mild pain, 26% reported the pain score as moderate and around 20% had severe pain score.

Lifestyle and behavioural characteristics:

50.24% of participants did not involve in exercise. All the participants are involve in physical activity in varying degree. Around 36% of selected subjects take 1-2 cup of tea/coffee per day while most of them take such drink occasionally. 298 (18.1%) participant take junk food regularly while most of them take junk food occasionally. Two-third of selected population get adequate sleep per night. About 41.43 % eat breakfast less than 5 days per week (table-3).

Table-1: Socio-demographic characteristics of study population

Parameter	Category	Frequency (n=1646)	Percentage
Age (year)1646)	14	191	11.6
	15	535	32,50
	16	393	23.88
	17	344	20.9
	18	127	7.72
	19	56	3.4
Age of menarche (year)	<10	26	1.58
	10	142	8.63
	11	265	16.1
	12	433	26.31
	13	508	30.86
	14	230	13.97
	15	42	2.55
Religion	Hindu	1280	77.76
	Muslim	366	22.24
BMI (percentile)	1st to 5th	84	5.1
	6th to 84.99th	1315	79.89
	> 85th	247	15.01
Mother	Illiterate	218 (	13.24
Education	Up to 10th	1084	65.86
(grade)	Up to graduate	311	18.89
	Post graduate and	33	2
	above		

Table-2: Prevalence of primary dysmenorrhea on the basis of age

Age (year)	Non-dysmenorrhea	Dysmenorrhea			
		Mild	Moderate	Severe	Total
14	29 (15.19)	85 (44.50)	54 (28.27)	23 (12.04)	162 (84.81)
15	60 (11.22)	241 (45.05)	132 (24.67)	102 (19.06)	475 (88.78)
16	39 (9.92)	167 (42.49)	105 (26.72)	82 (20.87)	354 (90.08)
17	33 (9.59)	145 (42.15)	86 (25.00)	80 (23.26)	311 (90.41)
18	11 (8.67)	51 (40.16)	34 (26.77)	31 (24.40)	116 (91.33)
19	10 (17.86)	24 (42.85)	12 (21.43)	10 (17.86)	46 (82.14)
Average	182 (11.06)	713 (43.32)	423 (25.70)	328 (19.93)	1464 (88.94)

Reproductive characteristics: There is wide variation of age of menarche from 9 years to 15 years with mean age of 12.13 + 1.33 years. Most of the participants experienced menarche in the age of 12-13 years. 35% respondents had regular menstrual cycle while rest were ether very irregular pattern or some cycle are regular followed by some irregular pattern. 55% of selected subjects had 28-35 days of cycle and 33.3% had below 28 days cycle and remaining had more than 35 days cycle. 49% of respondents had 4-5days of menstrual flow and 33% had more than 5 days menstrual flow. 21.4% had menstrual flow without clot blood and rest with varying degree of clot blood in menstrual flow (table-3).

Table-3: Socio-demographic, life style and behavior and reproductive characteristics of study population and their association with incidence of dysmenorrhea

Variables	Sub type	Non-dysmenorrhea	Dysmenorrhea	Chi-square
Religion	Hindu	152	1128	1.322^{NS}
	Muslim	30	336	
Mother education (grade)	Illiterate	23	195	3.047^{NS}
	Up to 10th	113	971	
	Up to graduate	39	272	
	above graduate	7	26	
Family history	No	126	785	5.392*
	Yes	56	679	
Physical activity	Less	29 (12.3)	206 (87.7)	1.319^{NS}
	Moderate	116 (10.4)	995 (89.6)	
	Heavy	37 (12.3)	263 (87.7)	
Intake of tea/coffee	Never	22 (14.77)	127 (85.23)	2.780^{NS}
	Occasionally	108 (10.32)	939 (89.68)	
	Daily	52 (11.55)	398 (88.45)	
Sleep	<8hr	61 (11.38)	475 (88.62)	0.088^{NS}
	8hr	63 (10.84)	518 (89.16)	
	>8hr	58 (10.96)	471 (89.04)	
Exercise	Never	90 (10.88)	737 (89.12)	1.569^{NS}
	Occasionally	76 (10.70)	634 (89.30)	
	Daily	16 (14.68)	93 (85.32)	
Junk food intake	Never	38 (14.45)	225 (85.55)	7.545*
	Occasionally	120 (11.06)	965 (88.94)	
	Daily	24 (8.05)	274 (91.95)	
Breakfast per week	> 5days	92 (13.49)	590 (86.51)	2.367^{NS}
	< 5days	90 (9.34)	874 (90.66)	
Menstrual Pattern	Regular	82 (14.23)	494 (85.77)	9.696*
	Mixed	66 (8.86)	679 (91.14)	
	Irregular	34 (10.46)	291 (89.54)	
Release of clot blood	Never	58	295	15.906*
	Less	100	860	
	Moderate	22	290	
	Heavy	2	19	
Duration of menstrual cycle	<28 days	45 (24.73%)	503 (75.27)	7.031*
	28-35 days	111 (12.25)	795 (87.75)	
	>35 days	26 (13.54)	166 (86.46)	
Bleeding duration	1-3days	43 (14.73)	249 (85.27)	9.885*
	4-5 days	93 (11.52)	714 (88.48)	
	>5 days	46 (8.41)	501 (91.59)	
Pain radiation	No	140	823	9.658*
	Yes	42	641	

Significant, NS – Non-Significant

Association of primary dysmenorrhea with study characteristics: The association between primary dysmenorrhea and demographic factors, lifestyle and behavioural factors was represented in table-3. We used chi square test to investigate whether there is any association between study parameters with incidence of primary dysmenorrhea. Among demographic factors significant association was noted with family history of dysmenorrhea. Among lifestyle and behavioral characteristics incidence of primary dysmenorrhea was significantly associated with junk food intake and skipping of breakfast. Significant association was observed between primary dysmenorrhea reproductive parameters like age of menarche, length of menstrual

cycle, release of clot blood during menstruation and pattern of cycle.

Linear correlation between primary dysmenorrhea and continuous characteristics is represented in table-4. Significant correlation was observed between degree of primary dysmenorrhea with age, frequency of junk food intake and menstrual duration. There was significant negative correlation between degree of dysmenorrhea and age of menarche. Insignificant correlation was noted with BMI and sleep duration.

Table-4: Correlation between degree of primary dysmenorrhea and continuous characteristics

Characteristics	Variable	correlation coefficient (r)	p
Demographic	Age	0.059	0.0160*
	BMI	(-) 0.029	0.24 NS
Life style	Frequency intake of junk food	0.084	0.0000*
Reproductive	Age of menarche	(-) 0.060	0.0137*
	Menstrual flow duration	0.115	0.0000*

* Significant, NS – Non-Significant

The predictive risk factors of dysmenorrhea were evaluated using multivariate logistic regression analysis. The results of logistic regression analysis are shown in table-5. According to this analysis age, family history of dysmenorrhea, frequency of junk food intake, skipping breakfast, intake of tea/ coffee, menstrual pattern, pain radiation, pain duration and release of clot blood during menstruation are significantly associated with menstrual pain intensity. BMI, mother education, menstrual cycle length, physical activity, exercise and sleep duration had statistically insignificant association with degree of menstrual pain.

Table-5: Factors associated with degree of primary dysmenorrhea

Variables	Coefficient	Std.Error	Z-statistic	Probability
Age	0.0782	0.0369	2.1181	0.0342*
BMI	-0.0253	0.0162	-1.5587	0.1191NS
Family History	0.7381	0.0942	7.8349	0.0000*
Mother Education	-0.1155	0.0768	-1.5032	0.1328NS
Tea intake	0.1649	0.0798	2.0665	0.0388*
Junk food	0.3426	0.0786	4.3585	0.0000*
Exercise	0.0742	0.0751	0.9981	0.3231NS
Physical activity	0.0438	0.081	0.5412	0.5883NS
Sleep duration	0.0112	0.0489	0.2297	0.8183NS
Skipping breakfast	0.3018	0.0932	3.2372	0.0012*
Age of menarche	-0.04	0.0362	-1.1033	0.2699NS
Cycle length	-0.0559	0.0815	-0.6859	0.4927NS
Cycle regularity	0.1479	0.0703	2.1019	0.0356*
Bleeding duration	0.0307	0.0319	0.9624	0.3358NS
Release blood clot	0.3527	0.0735	4.7962	0.0000*
Pain radiation	0.9622	0.1127	8.5402	0.0000*

* Significant, NS – Non-Significant

DISCUSSION:

In this study prevalence of dysmenorrhea was 89% among adolescent. . Our observation is consistent with previous (22). Our study suggests that nearly 51% of dysmenorrheic females experienced moderate to severe dysmenorrhea while in Ethiopia 28.5% had moderate to severe, in Malaysia 6.8% had moderate to severe and in Jordan 55.8% had moderate to severe dysmenorrhea. Such vast differences may be due to the scales used for assessment of pain (23-24) age variation and sample size.

The inverse relationship between age and risk of dysmenorrhea was reported in various studies (25, 26). In this study we observed direct significant association of age with incidence of dysmenorrhea as well as degree of dysmenorrhea. Such inconsistent may be due to limited age (14 to 19 years) of the subjects.

Family history of dysmenorrhea demonstrated strong association with incident of dysmenorrhea and menstrual pain intensity. Our result was consistent with previous studies (27, 28). No significant associations were detected between religion, mother education level and BMI. To date only a few population-based longitudinal studies have investigated the association between BMI and dysmenorrhea. In one study reported that overweight is associated with increase pain duration (29). But other studies failed to establish the association of BMI with incidence of dysmenorrhea (30) and severity of dysmenorrhea (31).

It was found that skipping breakfast increases the risk of dysmenorrhea. Our result is consistent with previous study among university students of Palestine (32). Sometimes skipping breakfast causes poor absorption of nutrients leads to irregular menstruation and increase pain intensity (33).

Statistically significant association was observed between irregular menstrual cycles and primary dysmenorrhea. Similar result was obtained in previous studies (32, 34). Menstrual irregularity may induce hyperprduction of prostaglandin from endometrium which increased uterine contraction as well as arterial vasoconstriction and causing ischemic pain.

Statistically insignificant association was observed between Length of menstrual cycle and degree of dysmenorrhea. A previous study on Japanese young women aged 19 to 24 years reported no association between lengths of menstrual cycle and degree of primary dysmenorrhea (35).

Menstrual bleeding duration is significantly associated with the incidence of primary dysmenorrhea. Adolescent girls who had bleeding duration more than 5 days had more chance of getting dysmenorrhea. Our findings is compatible with the previous results showing dysmenorrhea is higher in women with long menstrual flows (36, 37). There is insignificant association between menstrual bleeding duration and intensity of menstrual pain.

CONCLUSION:

Prevalence of primary dysmenorrhea was high among adolescent females living in West Bengal, India. Family history of dysmenorrhea, skipping breakfast, intake of junk foods, menstrual irregularity, bleeding duration and presence of clot blood in menstrual flow are the risk factors for primary dysmenorrhea and its intensity. BMI, Mother education level, age, age of menarche are insignificantly associated with incidence of dysmenorrhea or intensity of pain.

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