IMPACT OF FAST FOODS ON MENSTRUAL HEALTH OF SCHOOL GOING ADOLESCENT GIRLS IN WEST BENGAL, EASTERN INDIA

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Abstract

Adolescent is the phase between childhood and adulthood. The most striking change in adolescent girls is the onset of menstruation or menarche. Consumption of fast foods are increasing worldwide among children and adolescent. Dietary habits are closely associated with quality of life of women of reproductive age. Now a day 75% of girls experience some problem associated with menstruation. The aim of our study is to find out the menstrual health status of school going adolescent girls and their association with fast food intake. A cross sectional questionnaires based study was conducted on adolescent girls who attained menarche at least 2 years ago in six secondary and higher secondary schools of West Bengal, eastern India. All students who attained menarche and willing to participate in the study were invited to answer the questionnaires. Questionnaires dealt with menstrual history, dietary habit and fast food intake frequency. Chi-square test was used to compare the frequency of fast food intake among students having menstrual abnormalities and those who do not have menstrual abnormalities. Dysmenorrhea and menstrual abnormalities were the frequent problem of adolescent girls. Significant correlation was noted between frequency of fast food intake with menstrual abnormalities and dysmenorrhea. In girls those take fast food regularly developed menarche in early ages. Our study showed a significant adverse effect of fast food intake on menstrual health status. Thus decreasing the intake of fast food and promoting the healthy eating habits should be emphasized in school health education programs to improve their menstrual health.

Key words: Fast food, menarche, dysmenorrhea, menstrual abnormality.

Introduction

Fast food refers to food that can be served ready to eat. Fast food culture is an emerging trend among the younger generation. The ready availability, taste, low cost, marketing strategies and peer pressure make them popular with children and adolescents. Junk food, a type of fast foods, simply means an empty calorie food. An empty calorie food is a high calorie or calorie rich food which lacks in micronutrients such as vitamins, minerals or amino acids and fibers but has high energy. These foods are lack of nutrients that body needs to stay healthy. Junk foods contain high levels of refined sugar, white flour, trans fat, salts and numerous food additives such as monosodium glutamate and tartrazine. At the same time it is lacking in protein, vitamins, essential minerals and fibers. Junk food causes adverse effects on health including: obesity, dental cavities, type2 diabetes, hypertension, stroke and heart disease, gastritis etc. High sodium has an impact on kidney function. Jackson et al. (2004) and Anderson & Butcher (2006) suggested that junk food increases risk of breast and prostate cancer, and osteoporosis at an early age.

Adolescence is the transitional phase of physical and mental development between childhood and adulthood and is characterized by immense hormonal changes. The most striking changes in the adolescent girls are the onset of menarche. Menarche signals the start of women's reproductive life and is determining by environmental and genetic factors (Speroff and fritz, 2005; Perry et al, 2009). The average age of menarche in Western European countries appears to have declined over the past 150 years over 16 to under 14 years (Pinola et al, 2012). In the United States, the normal age range of menarche is 9.1 to 17.7 years with a median of 12.8 years (Anderson et al, 2005; Jackson et al, 2004). There is no evidence that the age of menarche has decreased over the past 30 years in USA (Anderson and Butcher, 2006). Due to change in life style, habits, diet, the prevalence of obesity increased in developed world which results in decrease age of menarche (Tomoko et.al, 2007). Early menarche is a risk factor of asthma in adulthoods (Ferenc et al., 2011). After menarche, common menstrual abnormalities that the female adolescent may encounter include dysmenorrhea, irregularities in menstrual flow and premenstrual symptoms. Now a day 75% of girls experience some problems associated with menstruation (Lee et al, 2006). These may lead to problems in academic excellence, achievements in sports as well as loss of self image. Menstrual disorder at the age of 16 is also a good marker of hyperandrogenemia and adverse lipid profile in later life (Pinola et al, 2012). Premenstrual symptoms were significantly high in girls those take excessive junk foods. But not many studies are done on their relation with menstrual abnormalities. Hence it is important to evaluate frequency of intake of junk foods on menstrual health status of adolescent girls. Our study aims to find out the menstrual health status in school going adolescent girls at suburban town of Hooghly district of West Bengal state and its relation with junk food intake frequency.

Materials and Methods

Study subject

The present study was conducted among normal healthy school children of 13-18 years studying in four schools in Hooghly district during their school hours. The prior written permission of school authority was taken. Written consent from the parents of the students experimented in the study was obtained. The subjects of this study were chosen at

random irrespective of socioeconomic status and religion so that reflection of an overall picture of menstrual health status of study region could be achieved. All students who attained menarche and who were willing to participate in the study were included in the study. They were invited to answer the questionnaires, which dealt with menstrual history and dietary habit. The female reproductive system usually requires approximately 2 years maturing before adolescent girls will have consistently regular ovulatory cycle (Sing et al, 2008). We excluded the students who did attain menarche at least 2 years, who are suffering from any chronic health condition, who are using any medicines for long duration and who are under weight or over weight in respect to age..

Study of Menstrual abnormality

The duration of menstrual cycle is defined as the period between the first day of menstrual flow and the day immediately prior to the next menstrual flow. Irregular menstrual cycles are defined as past history of irregular cycles experienced by the students with in sixth months prior to the study. In this study abnormal length of menstrual cycle was defined as subject with length of cycle is <21 or >35 (Sing et al, 2008). Abnormal duration of flow is defined as menstrual bleeding which lasted for less than 2 days or more than 7 days (Paula, 2007).

Study of menstrual disorder, dysmenorrheal

Dysmenorrhea is defined as acute spasmodic pain experienced in the lower abdomen which appeared on the first day of menses and rarely lasted more than two days. It was divided into three grades Fujiwara. 2004): grade-1: not requiring analgesic; grade-2 painful, requiring analgesic; grade- 3: painful, not relieved by analgesic.

Study of fast food intake

Fast foods include chips, chocolate, ice-cream, soft drinks, burgers, pizzas, chowmein, pakora, samosa etc. (Kaushik et al., 2011). Fast food consumption was studied on the basis of frequency of eating: category- a: 1 day/ week; category-b: 2-3 days/ week, category- c: 4-6 days/ week and category- d:7 days/ week.

Anthropometric measurement

Body weight was measured using bathroom scale accurate to 0.5kg. The scale was kept on a flat surface and adjusted with '0' mark. Now the subject was requested to step on it in bare feet. Weights were taken in light cloth. Weight was recorded to the nearest 0.5kg.
Height was measured using anthropometric rod. Height of the subject was recorded without footwear and expressed to the nearest 0.1cm.
Body mass index BMI was calculated from the height and weight using following equation: BMI (kg / m^2) = weight (kg) / height^2 (m). The subjects with BMI for age less than 5th percentile were categorized as thin and those with BMI for age >85th percentile were considered to be over weight while subjects having BMI for age between 5th and 85th percentile were categorized as normal (Anita and Santosh, 2007). Percentile of BMI was considered according to National Centre for Health statistics (NCHS).

Statistical analysis

Prevalence of menstrual abnormality was calculated and expressed as proportions. Chi-square test was used to determine association between abnormalities and frequency of fast food intake. Pearson correlation was used to find the significant relationship between frequency of fast food intake and age of menarche.

Result

Total 826 girls were interviewed but 156 girls were excluded. Subject profiles were represented in table 1.

Table-1: Profile of study subjects

Characteristics		Number of subject	Percentage
Age (year):	13	133	19.85
	14	134	20.00
	15	164	24.48
	16	118	17.61
	17	71	10.60
	18	50	7.46
Schooling status:	Class VIII	190	28.36
	Class IX	173	25.82
	Class X	140	20.90
	Class XI	96	14.33
	Class XII	71	10.59
Marital status	Married	-	
	Unmarried	670	100
Type of food habit	Veg	36	5.37
	Nonveg	634	94.63
BMI	Under weight (<5th percentile)	---	----
	Normal weight (5th to85th percentile)	670	100
	Over weight and obese (.85th percentile	-----	---

Frequency of fast food intake of the subjects was represented in table-2. Significant percentage of the subjects takes fast food every day in a week.

Table-2: Patterns of fast food intake habit of adolescent school going girls

Fast food intake (day /week)	Number	Percentage
Category-a (1-2)	242	36.12
Category-b (3-4)	164	24.48
Category-c (5-6)	134	20.00
Category-d (7)	130	19.40
Total	670	100

Table-3 represents age of menarche of study subjects. Initiation of reproductive life of adolescent school going girls varies from 10 years to 16 years with mean age of 12.56 years.

Table-3: Distribution of study subjects on the basis of age of menarche

Age of menarche (year)	Number of subject	Percentage
10	51	7.61
11	123	18.36
12	202	30.15
13	179	26.72
14	86	12.83
15	25	3.73
16	4	0.60
Total	670	100

Age of menarche in respect fast food habit was represented in table-4. According to this result girl whose fast food intake frequency is more they mature sexually earlier than other whose fast food intake frequency is less.
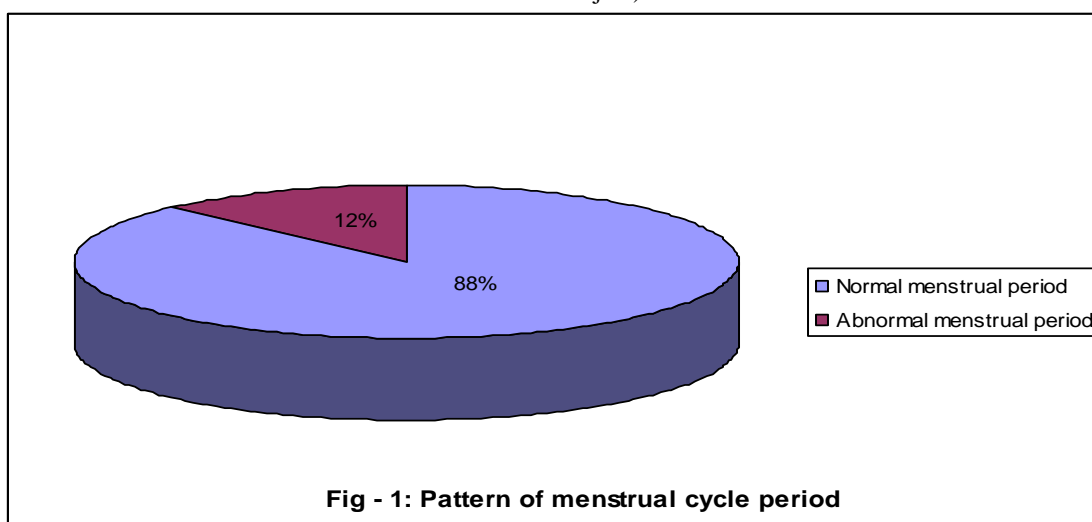.

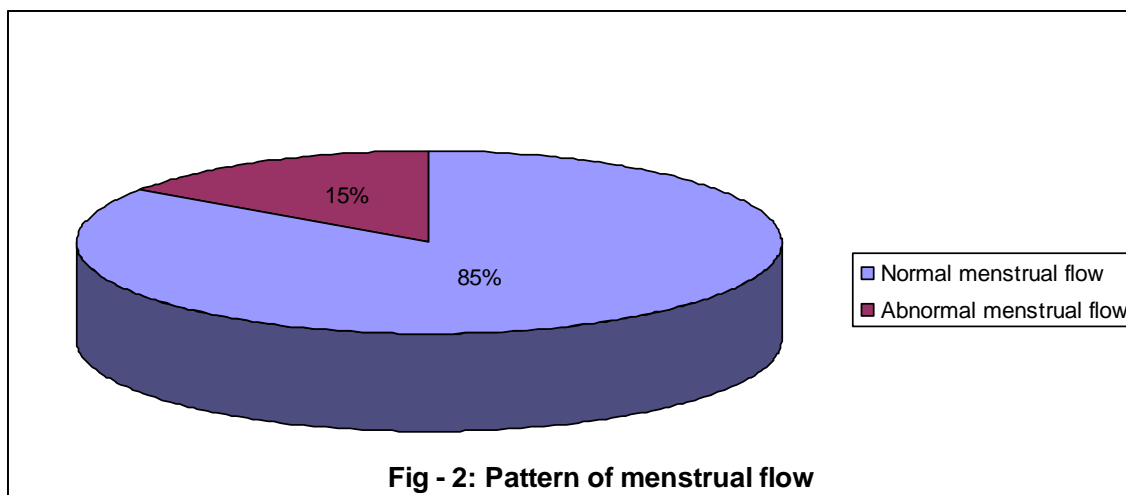Table-4: Frequency of fast food intake and age of menarche

Fast food intake (day/week)	Age of menarche (year)
1-2 (1.446)	12.76 ± 1.49
3-4 (3.493)	12.45 ± 1.10
5-6 (5.425)	12.06 ± 1.11
7	11.52 ± 1.13

*data represent mean $\pm$ SD, parenthesis indicate average

Menstrual irregularity of school going adolescent girls was represented in figure-1 and in figure-2. 12.39% of study subjects were suffer in abnormal length of menstrual cycle (3.88% having <21 days and 8.51% having > 35 days cycle). 15.37% of the study subjects show abnormal duration of menstrual flow (< 3 days for 4.03% subject and >7 days for 11.34% subject).

Fig - 1: Pattern of menstrual cycle period

Fig - 2: Pattern of menstrual flow

Duration of menstrual flow in respect to fast food habit was represented in table-5. 19.23% of adolescent who take fast food every day in a week show over duration of menstrual flow where as it is 6.20% for girls those take fast food at a frequency of 1 to 2 days per week.

Table-5: Pattern of fast food habit and duration of menstrual flow of study subjects.

Junk food intake (day/week)	Duration of menstrual flow (day/cycle)			
	1-2	3-5	6-7	>7
1-2 (n=242)	7 (2.89%)	189 (78.01%)	31 (12.90%)	15 (6.20%)
3-4 (n=164)	10 (6.10%)	107 (65.24%)	31(18.90%)	16 (9.76%)
5-6 (n=134)	5 (3.73%)	87 (64.92)	22 (16.53%)	20 (14.92%)
7 (n=130)	5 (3.85%)	70 (53.85%)	30 (23.07%)	25 (19.23%)
Total	27 (4.03%)	453 (67.61%)	114 (17.01%)	76 (11.34%)

Length of menstrual cycle in respect to fast food habit was represented in table-6. 13% of adolescent who take fast food every day in a week show longer cycle period where as it is 4.54% for girls those take fast food at a frequency of 1 to 2 days per week.

Table-6: Pattern of fast food habit and length of menstrual cycle of study subjects.

Fast food intake (day/week)	Length of menstrual cycle		
	<21 days	21-35 days	>35 days
1-2 (n=242)	7 (2.89%)	224 (92.57%)	11 (4.54%)
3-4 (n=164)	6 (3.66%)	145 (88.41%)	13 (7.93%)
5-6 (n=134)	5 (3.73%)	113 (84.33%)	16 (11.94%)
7 (n=130)	8 (6.15%)	105 (80.77%)	17 (13.08)
Total	26 (3.88%)	587 (87.61%)	57 (8.51%)

63.13% of study subjects having menstrual problem, dysmenorrheal (fig.-3). Percentage of dysmenorrhagic subject in respect to frequency of fast food intake was represented in table 6. Most of the dysmenorrhea is grade one type i.e. not require analgesic. 16.97% dysmenorrhea is painful type.
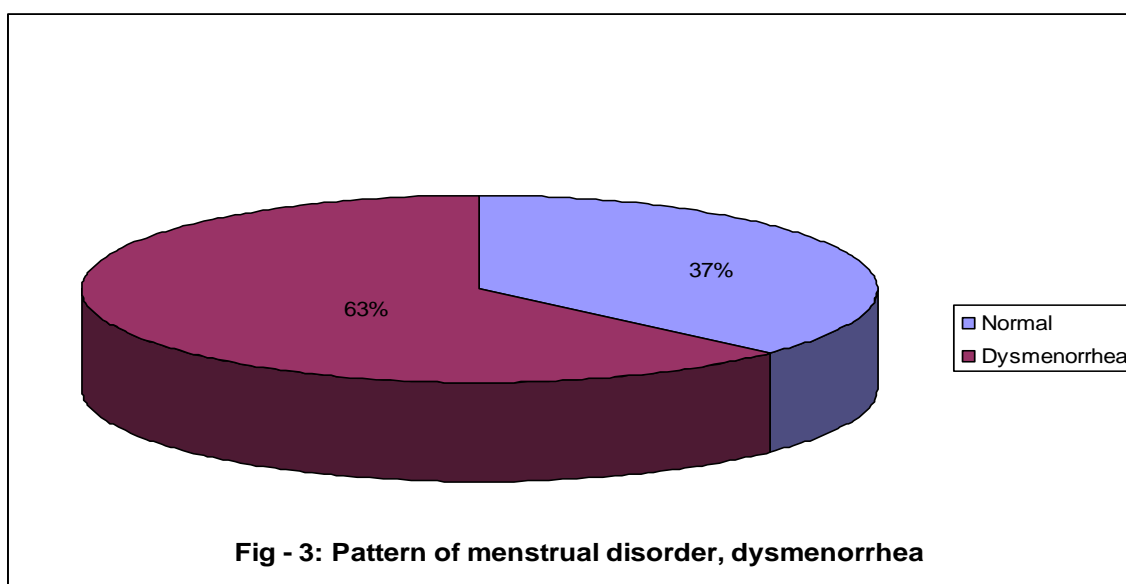

Fig - 3: Pattern of menstrual disorder, dysmenorrhea

Table 7. Pattern of fast food habit and dysmenorrhea of adolescent school going girls

Fast food intake (day/week)	Number of subjects	Dysmenorrhea		Nondysmenorrhea	
		Number	Percentage	Number	Percentage
Category-a (1-2)	242	110	45.45	132	54.55
Category-b (3-4)	164	105	64.02	59	35.98
Category-c (5-6)	134	100	74.63	34	25.37
Category-d (7)	130	108	83.08	22	16.92
Total	670	423		247	

Significant association was noted between frequency of fast food intake and menstrual irregularity and also with menstrual disorder. (table-8).

Table-8: Association between frequency of fast food intake and menstrual parameters

Association between	Chi square	P value
Frequency of fast food intake and abnormal length of menstrual cycle	12.5003	<0.01
Frequency of fast food intake and abnormal duration of menstrual flow	14.4113	<0.01
Frequency of fast food intake and dysmenorrhea	90.2770	<0.001

Discussion

Dietary habits are fundamental factors that influence human life styles and individual quality of life. The dietary habits in young women may determine their quality of life in subsequent middle or old age. Fast food culture is an emerging trend among the younger generation. The ready availability, taste, low cost, marketing strategies and peer pressure make them popular with children and adolescents. Fast food restaurants are primed to minimize the speed, efficiency and conformity. The menu is kept limited and standardized essentially to minimize the waiting time so that customers eat quickly and leave. This perspective delineates the emerging fast food culture in India.

India has rich heritage of foods and recipes. Popular north Indian fast foods include aloo tikki, bhelpuri, chaat, pakora, chole bhature, pav bhaji, dhokla, samosa and pani puri. Calorie and fat content in Indian fast foods depends on the cooking method. Most of Indian fast foods are prepared by deep frying in fats especially trans fat and saturated fats (Kaushik et al, 2011). Foods which are baked, roasted or cooked in tandoor have lower fat content. Trans fat content in Indian fast food are far higher than Western foods. Trans fat content in bhatura, paratha and puri is 9.5%, 7.8% and 7.6% respectively as compared to 4.2% in regular French fries (kaushik et al, 2011). South Indian foods like idli and uthappam are better as they are rich in carbohydrates and proteins rather than fats.

Fast foods have high level of fat and sugars that are not only unhealthy but addictive that creates a vicious cycle making it hard for children to choose healthy foods. High content of trans fat in commercially available fast foods predispose children to risk of future heart diseases (Asgary et al, 2009). Fast food intake leads to higher proportion of calories being derived from total and saturated fats (Schmidt et al,2007. Moreover, the micronutrients content (carotene, vitamin A, vitamin C) of the fast food is also low (Bowmann and Vinyard, 2004). Low levels of calcium and magnesium in the diet can contribute to osteoporosis.

Age at menarche signals the start of women's reproductive life. Early menarche is associated with several aspects of adult health. Women with early menarche have an increased risk of cardiovascular disease, breast cancer, and metabolic syndrome including obesity and type-2 diabetes (Golub et al., 2008; Heys et al., 2007). Initiation of menarche is also influenced by fast food intake (table-4). There is negative correlation between fast food intake frequency and age of menarche. This observation suggests that change of dietary habit may be one of the causes of decrease of age of menarche from 15-16 years to less than 13 years (Speroff and Fritz, 2005). Large multinational study shows that lung function was lower and asthma more common among adult women with menarche before the age of 11 years (Ferenc et al., 2011).

In this study we noted that 15% girls had irregular cycle (fig.-1) in respect to duration of menstrual flow and 9% in respect to length of cycle (fig-2). Menstrual irregularity depending on frequency of intake of fast foods (table-5 and 6).

Dysmenorrhea is a most frequent problem of adolescent girls (fig-3). It is more common in the girls who take fast food regularly (table-6). Fujiwara et.al (2009) also found an association between fast food consumption and dysmenorrheal. Frequency of fast food intake was significantly associated with dysmenorrheal (table-8).

Significant association was observed between frequency of fast food intake and menstrual irregularity as well as dysmenorrheal (table-8).

Conclusion

Menstrual health is a fundamental to women's sexual and reproductive health. Changes in the normal menstrual patterns of women in reproductive age group may affect physical and psychological well being. Life style modification particularly decreasing the intake of fast food and promoting healthily eating habits should be emphasized in school health education programmed to improve menstrual health. Improvement of menstrual health will not only help in improving the academic performance of the students but also prevents future problems like polycystic ovarian disease, hyperlipidemia, infertility, cardiovascular disease, diabetes and respiratory diseases.

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