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Full Length Research Paper

A study of the age at menarche and menstrual cycle pattern among schoolgirls in Kassala, Sudan

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A cross-sectional school survey was carried out during January to February 2010 in 8 schools to investigate the age at menarche, menstrual cycle pattern among school girls in Kassala, eastern Sudan. Structured questionnaires were used to gather the socio-demographic data, age at menarche, regularity of the menstrual cycle and associated symptoms. Out of 900 schoolgirls investigated their age ranges between 9 to 19 with mean ± SD of 14.0 ± 4.7 years. Only 73% experienced menarche by the time of interview. The mean age ± SD of 13.07 ± 1.0 years, which was 0.9 year younger in the urban girls. The majority of girls (76.4%) experienced delayed menarche. The period was regular in 68.5% of these girls with the cycle length ranges between 21 to 35 days the mean ± SD duration of blood flow was 4 ± 1.2 days. The overall prevalence of dysmenorhea was 83.1 and 59.8% of the subject experienced premenstrual symptoms. In conclusion the menarcheal age was delayed in our study, it varies with residence, dysmenorrhea was a common health problem among the school girls.

Key words: Menarche, menstrual cycle, school girls, Sudan.

INTRODUCTION

Adolescence is a transition period from childhood to adult life during which pubertal development and sexual maturation takes place. During puberty, hormonal, psychological, cognitive and physical changes occur simultaneously and interactively making physiological development a challenge adolescents have to face, with emotional, social and behavioral dimensions. A feature of sexual maturation in the human race is the 4 to 5 years physiological variation of pubertal age observed in normal individuals living in the same conditions (Tanner, 1962). This variability is mainly due to genetic, ethnic, environmental and nutritional factors (Kaprio et al., 1995). Considering girls, age variations of menarche may be important: previous studies have shown that 5% of the population reported ages at onset before 10 or after 15 years (Ailbereisen and Karacke, 1996). Menarche varies from population to population according to different factors like nutritional, geographical and environmental conditions and most of the female experience it when they are 10 to 16 year old (Thomas et al., 2001; Katsunori and Shinichi, 2005; Kaplowitz, 2006).

Menstrual disorders like delayed menarche, premen-strual symptoms and dysmenorrhoea create a great anxiety among the adolescent females and their families, thus it is very important to know menstrual cycle pattern and variation for clinical evaluation and patient education (Adam, 2002; Diaz et al., 2006). Investigating the age of menarche and menstrual problems among adolescent is of much importance so as to provide health planners and caregivers with fundamental data necessary for interventions. While much data concerning age of menarche and problems among adolescent are available in the other countries (Okusanya et al., 2009; Padez, 2003; Rebacz, 2009), few such data available in Sudan (Attallah et al.,1983) which is the largest African country with 40 million populations.

Recently we have observed that out of 187 adolescent schoolgirls in eastern Sudan, 181 (96.8%) had anaemia and teenager women were at higher risk for anaemia and their babies had significantly low birth weight (Abdelrahim et al., 2009; Adam et al., 2009). Hence the current study was conducted to investigate the age at menarche, menstrual cycle pattern among school girls in Kassala,

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eastern Sudan.

MATERIALS AND METHODS

A cross sectional schools survey was conducted to investigate age at menarche, menstrual pattern and knowledge among schoolgirls in Kassala, eastern Sudan between January and February 2010. Random selection of 8 schools and 900 of girls from these schools were enrolled, 4 were secondary and the others were primary schools and only grade 6 to 8 were selected from the primary schools because their age range within the ideal age of menarche. After taking the consent and explanation of the purpose of the study, the self anonymous classroom- administered questionnaires was administered in local language (Arabic) to gather socio-demographic data, menarcheal age, menstrual cycle pattern, premenstrual symptoms, associated symptoms and dysmenorrhea (pain during menstruation), and medical intervention during the menses and impact on school attendance (Table 1).

The questionnaires distributed and collected on the same day. The girls have been asked about their age when the menarche occurred, the menarcheal age and the age of the girls defined as age completed in year at the time of interview using the recall method and we categorized the age of menarche into three groups: 12 year (early menarche), between 13 and 14 year (less medium menarche) and more than 14 year (delayed menarche) (Montero et al., 1999). Data were into computer database and SPSS software (SPSS Inc., Chicago, IL, USA, version 13.0) and double checked before analysis. Student t -test and Chi square tests were used to compare mean ± SD and proportions, respectively. $P < 0.05$ was considered significant.

Ethics

The study received ethical approval from the Health Research Committee Board, Ministry of Health at Kassala State.

RESULTS

The age of the girls, who were interviewed in this study ranges between 9 to 19 with mean and standard deviation of 14.09 ±4.76 years, 469 were of rural residence while 431 were urban ones. Out of 900 girls who were investigated in this study 243 (27%) girls did not yet experience their first menstruation at the time of interview, their age ranges between 9 to 15 years and these students were not included in the analysis of age at menarche, menstrual pattern and disorders. The mean age and standard deviation at menarche was 13.07±1.0 years and the mean age at menarche was 0.9 years younger for urban girls compared with rural ones (12.63 ±1 vs.13.50 ±0.87) and Table 2 showed the comparison between both groups considering the menstrual cycle pattern. Out of 657 menstruating students 28 (4.3%) experienced early menarche, 127 (19.3%) less medium menarche and 502 (76.4%) late menarche. Menstrual cycles were irregular in 165 (25.1%) and 291 (44.3%) had dysmenorrhea (painful cycles) which causes absence from school in 102 (20.3%) and needed analgesia for pain relief in 124 (18.9%) of the girls (Table 1).

The length of the cycle ranges between 21 to 35 days in 68.5 (450/657), it was shorter than 21 days in 7.8% (51/657) and longer than 35 days in 23.7% (156/657). The mean duration of the menstrual blood flow was 4±1.2 days and 59.8% (393/657) of the menstruating students suffered from premenstrual symptoms with generalized fatigue (186, 47.3%) the most common symptom followed by depression in (67, 17%) (Table 1).

DISCUSSION

The mean age at menarche in the current study is comparable with other reports in Khartoum (Attallah et al., 1983) Sudan (13.85 year), in Nigeria (13.40 year) (Okusanya et al., 2009) and in Mozambique (13.91, years) (Padez, 2003). In neighboring Ethiopia and Tanzania the age at menarche by the recall method was 14.3 ± 1.1 and 15.8 ± 1years, respectively and the age of menarche was lower in urban girls (Zegeye et al., 2009; Rebacz, 2009). However, age at menarche has largely decreased in most developed countries and seems stabilized at 13 years with 0.5 year variations between countries and the decreased age of menarche is important because of its potential impact on early-matured girls' behaviors (Ong et al., 2006; Gaudineau et al., 2010). Menarche is an index of female physical maturation occurs during puberty when the female becomes capable to reproduce.

Many explanations were adopted for example, weight and fat hypothesis for triggering the onset of menarche, therefore changes and variation in the age at menarche is commonly observed (Frisch and Revelle,1970; Johnston et al., 1975; Trussell,1980) and the difference in the menarcheal age and menstrual cycle pattern between the rural and urban girls might be explained by the difference in socio-demographic status, and body fat in addition to the stress created by the distance between the schools and the girls' village. Since, the majority of study subjects (76.4%) experienced delayed menarche and the data obtained by the recall method, it might be necessary to conduct more research for the accuracy of age at menarche and influential factors.

In the current study, the cycle was irregular in 25.1% of the respondents. This is considered as normal event due to the ovulation in the first two years after menarche (Adam, 2002). The current study showed that, dysmenorrhea and premenstrual symptoms had prevalence of 44.3 and 59.8%, respectively and dysmenorrhea was the cause of school absences for 20.3% of the affected student. In Nigeria, the prevalence of dysmenorrhoea was 76.3% and the normal activity was affected by dysmenorrhoea in 35% of under-graduates respondents (Okusanya et al., 2009). In the neighboring Ethiopia, prevalence of dysmenorrhoea and premenstrual symptoms was 72.0 and 75.4%, respectively, however only 20.3% of the dysmenorrheic girls were reported to be absent from the schools (Zegeye et al., 2009).

Table 1. Menstrual characteristics of schoolgirl in Kassala, eastern Sudan.

Menstrual characteristics	Number	%
Duration of flow (days)		
< 3	5	0.8
3 to 5	430	65.4
6 to 8	212	32.3
> 8	10	1.5
Total	657	
Cycle length		
20 days	51	7.8
21 to 35 days	450	68.5
> 35 days	156	23.7
Total	657	
Dysmenorrhea		
No	366	55.7
Yes	291	44.3
Total	657	
Premenstrual symptoms		
No	264	40.2
Yes	393	59.8
Total	657	

Table 2. Comparison between schoolgirls in menstrual cycle pattern by residence, Kassala, eastern Sudan*.

Variable	Urban girls	Rural girls	P
Age at menarche	12.63±1	13.50±0.87	0.6
Regular cycles	227 (34.6%)	99 (15%)	0.002
Dysmenorrhea	164 (25%)	127 (19.3%)	0.002
Use of analgesia	65 (9.9%)	59 (9%)	0.6
Premenstrual symptom	188 (28.6%)	205 (31.2%)	0.2
School absence	53 (8.1%)	49 (7.5%)	0.2

Data are shown as mean± SD or number (%) as applicable.

In Mexico dysmenorrhea had much lower prevalence (48.4%) but it was the cause of school absences for 24% of the affected students (Ortiz et al., 2009). Yet, Sudan is the large country with different cultures and various socio-demographic characteristics that might have their influence on the age and the menstrual pattern and the results of the study would not be generalized. In summary, Menarche age was found delayed and menstrual cycle pattern in particular dysmenorrhea and regularity of the cycle varied with residence. There was high prevalence of dysmenorrhea among school girls which causes short period school absence. More research is needed.

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