The age at menarche amongst secondary school girls in Sokoto metropolis, North-West Nigeria

Original Article

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ABSTRACT

Background: Several studies suggest that menarche tends to appear earlier in life as sanitary, nutritional and economic conditions of a society improve**.**
Aim / Objective: To determine the age at menarche amongst secondary school girls in Sokoto metropolis and the influence of socio-economic status on this parameter.
Methodology: This is a cross-sectional study involving four different secondary schools in Sokoto metropolis, conducted between September and October 2010. Systematic sampling method was used to select 460 adolescent girls, and a pre-tested questionnaire was used to gather data. The 460 girls cooperated by completing the questionnaire under the supervision of members of the research team, but only 381 of the girls were finally recruited for the study.
Results: The age range at menarche was 10-16years and the mean was 13.67 ± 1.2years. The average age at menarche, based on social class, was 13.20 ± 1.1years (class I), 13.37 ± 1.3years (class II), 13.88± 1.5years (III), 13.92± 1.2years (class IV) and 13.98 ± 1.1years (class V).There was no significant difference in the average menarcheal age at different social classes (P>0.05).
Conclusion: The average age at menarche, in this study, is comparable to that of most previous reports in Nigeria, and socio-economic status appears to have no significant influence on the age at menarche.

Keywords*: Age, menarche, Sokoto, Nigeria.*

INTRODUCTION

Menarche is the onset of menstruation, and is one of the most significant milestones in a woman's life.[1] The mean age at menarche varies from population to population and is known to be a sensitive indicator of nutritional status, geographical location, environmental conditions and magnitude of socio-economic inequalities in a society.[2,3] For most females, it occurs between the age of 10 and 16 years.[3]

Several studies suggest that menarche tends to appear earlier in life as sanitary, nutritional and economic conditions of a society improve.[4-6] Studies on age at menarche have been conducted in different parts of Nigeria including South-South, South-East, South-West, North-Central and North-East, but none in North-West Nigeria.[5,7,8,9,10,11] This, was the reason for the present study.

METHODOLOGY

A cross-sectional study was conducted in four different secondary schools (two Federal-owned and two State-owned) within Sokoto metropolis, between September and October 2010. Using a systematic sampling method, a total of 460 healthy girls were selected (115 from each school). A pre-tested questionnaire was used to gather data during a five-week period in September and October 2010.

Selected girls cooperated in answering the questionnaire in their classrooms under the supervision of members of the research team. Out of 460 girls that responded to the questionnaire, only 381 had experienced menarche by the time of this study. The data of 79 girls were excluded from the study either because they had not attained menarche or they provided inadequate information.

Areas covered by the structured questionnaires included age, present class in school, and parents' occupation / educational status. The height and weight of each of the 381 respondents were measured and recorded. Social classes of respondents were determined according to the method of Oyedeji with some modifications.[12,13] Socio-economic index scores were awarded to the respondents based on the parents' occupation and educational status. The mean of the four scores (two for father and two for mother), to the nearest whole number, was the assigned social class.

Based on:

Occupation

Class1. Senior public servants, professionals, managers, large scale traders, businessmen and contractors
Class II. Intermediate grade public servants, secondary school teachers, nurses and intermediate grade traders
Class III. Primary school teachers, junior public servants – clerical and secretarial staff, auxiliary nurses, drivers, artisans and mechanics
Class IV. Petty traders, labourers, messengers and similar grades
Class V. Unemployed, full time housewives, students, subsistence farmers and apprentices

Educational Attainment

Class I. University graduates or equivalent
Class II. School certificate (SSC/OL GCE) holders who had teaching or other professional training
Class III. School certificate or grade II teachers certificate holders or equivalent
Class IV. Uncompleted secondary school education holders or equivalent, first school leaving certificate holders
Class V. Uncompleted primary school education and illiterate persons

The authorities of the Secondary Schools and the respondents concerned were informed and educated on the proposed study. Signed informed consent was obtained from each of the girls on the first page of the questionnaire, and the School authorities consent was also obtained before the study was carried out.

Data entry and processing were done with EPI INFO 2005. Statistical analysis was done using one-way Analysis of Variance (ANOVA). The Probability of 0.05 was adopted as significant.

RESULTS

The age range at menarche was 10-16 years and the mean was 13.7±1.2years. The differences in the mean age at menarche among different social classes were not significant (p >0.05). The mean weight, height and body mass index (BMI) of the subjects were similar among the different social classes, and the overall mean weight at menarche was 48.7±7.9kg, whereas the mean height and body mass index (BMI) were 159.2±7.4cm and 19.4±1.1kg/m^2, respectively. Ninety percent of the respondents attained menarche between 12 and 15years (Table 1). The physical characteristics of the subjects according to their socio-economic status, together with the mean age at menarche, are summarized in table 2. Social Class I has the youngest mean age at menarche (13.20±1.1years) while social class V has the oldest average age at menarche (13.98±1.1years).

Table 1. Age at menarche

Age at menarche (years)	Frequency	%
11	13	3.4
12	34	8.9
14	113	29.7
15	74	19.4
16	21	5.5
Total	381	100

Table 2. Age at menarche, physical characteristics and socio-economic status of the respondents

Category /Social Class	Number	Age (years)	Age at Menarche (years)	Height (cm)	Body Weight (kg)	BMI kg/m^2
Class I	32	15.6(1.1)	13.20(1.1)	156.5(1.1)	50.3(9.3)	20.36(1.0)
Class II	126	15.7(1.2)	13.37(1.3)	159.5(7.5)	48.4(8.2)	18.91(0.8)
Class III	168	16.0(1.3)	13.88(1.5)	159.8(7.0)	48.6(7.5)	18.98(1.1)
Class IV	44	15.7(1.7)	13.92(1.2)	158.9(6.0)	49.0(7.8)	19.36(1.1)
Class V	11	16.6(1.1)	13.98(1.1)	161.7(3.5)	49.6(7.0)	19.18(1.2)
Total	381	15.9(1.3)	13.67(1.2)	159.2(7.4)	48.72(7.9)	19.36(1.1)

SD Standard deviation values in parenthesis

DISCUSSION

Several studies on menarcheal age have been conducted in Nigeria.[7,8-14] These studies have shown a progressive lowering of the age at menarche among Nigerian girls, and this has been attributed to a gradual improvement in the standard of health and nutrition.[15] The mean menarcheal age of 13.7years in this present study is comparable to those in Rivers State (13.9years), Edo State (13.4years), Maiduguri (13.6years) and Ibadan (14years).[15,16,17,4,11] It is also similar to 13.9yearsm in Sudan and 13.9years in Mozambique.[18,19] However, it is lower than 14.4years reported sixty years ago in Nigeria, 14.8years in Ethiopia and 15.8years

in Tanzania, but higher than 12.1years in United States of America.[20-22,2]

The secular trend towards younger menarcheal age has been reported in many developing countries as well.[18,19] Although many causes have been proffered for the secular trend in the age at menarche, there is a general agreement that this trend is largely influenced by environmental factors.[3,5]

The age at menarche has enormous implications on the reproductive health and wellbeing of women. Early age of menarche is among the established risk factors for breast and endometrial cancers.[23] It has also been associated with metabolic syndrome and overweight.[24] Indirectly, it also poses a public health concern as it may result in earlier onset of sexual activity predisposing to sexually transmitted infections like human immune-deficiency virus/acquired immuno-deficiency syndrome (HIV/AIDS), unwanted pregnancies and unsafe abortions, with their attendant sequelae. Depression, eating disorders and poor school performance are among the other teenage problems that have been associated with early menarche.[25]

The early age at menarche in North-West Nigeria has reproductive health consequences because of early marriage practised in this region which would ultimately lead to teenage pregnancy and its obstetric complications, besides the fact that early age at coitus is one of the risk factors of cervical cancer, known to be prevalent in that region. On account of this, adolescent reproductive counselling is desirable in the education of the parents on these reproductive health issues.

In contrast to the results of several previous studies, which revealed that girls from the higher socio-economic class attained menarche earlier than their counterparts in the lower classes, there was no significant difference in the age at menarche amongst the different social classes in this study.[2,3,4,19] Some previous studies have, nevertheless, shown no significant influence of socio-economic status on the menarcheal age.[1,8] The subjects in this present study were all residing in Sokoto metropolis, therefore, they might have been exposed to comparable socio-economic / environmental factors, thus limiting the influence of differences in socio-economic/environmental factors on their menarcheal age. Perhaps, a comparison of subjects from a rural environment and those from an urban environment could have given a better picture on the influence of these factors on age at menarche in the study area. Pasquet *et al* in Cameroon noted that mean age at menarche in urban areas (13.2years) was younger than that in rural areas (14.3years).[26]

The association between menarche and nutrition is a well-known fact, and it has been postulated that menarche is achieved at a critical body weight.[27] Mocanu *et al* found in their study that despite the deceleration in the age at menarche, the body weight at which menarche occurred remained unchanged at 47.5±0.5kg.[8,28] Fakeye at Ilorin, found 47.4±0.52kg as mean weight at menarche, while Marinho and Marinho in Ibadan reported a mean weight of 49.7kg.[29,15] The critical weight at menarche in this study (48.7 ±7.9kg) is comparable to these earlier reports.

Frisch and co-workers reported that body composition and the percentage of body fat, rather than absolute weight, had a correlation with pubertal development and reproductive competence. They emphasized that fats should comprise 17% of the total body weight for menarche to occur and 22% for the maintenance of ovulatory cycles.[30] The mean height at menarche in this study (159.2cm), is similar to 152.3-156.2cm reported by previous authors in the country.[10,11,13]

In conclusion, the overall mean age at menarche in this study (13.7years) is

comparable to most previous reports in Nigeria; however, socio-economic status did not appear to have a significant influence on menarcheal age.

REFERENCES

1. Ayotallahi SM, Dowlatabadi E, Ayotollahi SA. Age at menarche and its correlates in Southern Iran. *Irn J Med Sci* 1999; 24(1&2):20-25.
2. Charles WC, Shurbert CM, Roche AF et al. Age at menarche and racial comparisons in US girls. *Paediatrics* 2003; 114(1):110-113.
3. Thomas F, Renaud F, Benefice E, de Meeus T, Guegan TF. International variability of ages at menarche and menopause: patterns and main determinants. *Hum Biol* 2001; 73(2):271-920.
4. Ikaroha CL, Mbadiwe INC, Igwe CU *et al*. Menarcheal age of secondary school girls in urban and rural areas of Rivers State, Nigeria. *Online J Health Allied Sci* 2005; 4(2):1-4.
5. Kaplowitz P. Pubertal development in girls**:** secular trend. Current Opinion in Obstetrics & Gynaecology 2006; 18(5):487-491.
6. Abioye-Kuteyi EA, Ojofeitimi EO, Aina OI, Kio F, Aluko Y, Mosuro O. The influence of socio-economic and nutritional status on menarche in Nigeria school girls. *Nutrition and Health* 1997; 11(3):185-197.
7. Ezem BU. Profile of menarche among school children in South Eastern Nigeria. *Niger J Health Med Sci* 2006; 5(2):87-88.
8. Toriola AL, Salakun SO. Age at menarche of secondary school girls. *Trop J Obstet Gynaecol* 1991; 9(2):7-9.
9. Rohan N. Characteristics of the menarche in Hausa girls in Nigeria. *J Obstet Gynaecol* 1994; 14(4):265-268.
10. Ekele BA, Udueyop EU, Otubu JA. Age at menarche amongst school girls in high altitude Nigerian town. *West Afr J Med* 1996; 15(3):170-172.
11. Jacks TH, Obed JY, Agida ET, Petrova GV. Dysmenorrhoea and menstrual abnormalities among post-menarcheal Secondary School girls in Maiduguri, Nigeria. *Afr J Med Sci* 2005; 34:87-89.
12. Oyedeji GA. Socio-economic and cultural background of hospitalized children in Ilesha. *Niger J Paediatr* 1985; 12:111-117.
13. Ugochukwu EF. Treatment of childhood diarrhoea: what mothers do. *Niger J Clin Pract* 2002; 5(1):64-68.
14. Dare FO, Ogunniyi SO, Makinde OO. Biosocial factors affecting menarche in a mixed Nigeria population; *Cent Afr J Med* 1992; 38(2):77-81.
15. Marinho AO, Marinho JO. Menarcheal age, height, weight, dysmenorrhea and menstrual regularity in Nigerian school girls. *Trop J Obstet Gynaecol* 1984; 4(1):1-7.
16. Okusanya BO, Garba KK, Okome GB, Ohiosimuan O. Menstrual pain and associated factors amongst undergraduates of Ambrose Ali University Ekpoma, Edo State, Nigeria. *Niger J Med* 2009; 18(4):409-412.
17. Moronkolu OA, Uzegbu VU. Menstruation: symptoms and management and altitude of female nursing students in Ibadan Nigeria. *Afr J Reprod Health* 2006; 10(3):84-89.
18. Attallah NL, Matta WM, El-Mankoushi M. Age at menarche of school girls in Khartoum. *Ann Hum Biol* 1983; 10(2):185-188.
19. Padez C. Age at menarche of schoolgirls in Maputo, Mozambique. *Ann Hum Biol* 2003; 30(4):487-495.
20. Ellis HWB. Age of puberty in the tropics. *Br Med J* 1950; 1:85-89.
21. Zegeye DT, Megabiaw B, Mulu A. Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. BMC Women's Health 2009; 9:29.
22. Rebacz E. Age at menarche in schools girls from Tanzania in light of socioeconomic and socio-demographic conditioning. *Coll Antropol* 2009; 33(1):23-9.
23. Rockhill B, Mooman PG, Newman B. Age at menarche time to regular cycling,

and breast cancer in North Carolina United States. Cancer Causes Control 1998; 9:447-454.
24. Adams LS, Gordon LP. Maturation, timing and overweight prevalence in United States adolescents' girls. *Amer J Public Health* 2001; 91:642-644.
25. Posner BR. Early menarche. A review of research on trends in timing racial differences, aetiology and psychosocial consequences. *Sex Roles* 2006; 5-431-5-322.
26. Pasquet P, Biyong AM, Rikong AH, Befidi MR, Garba MT, Froment A. Age at menarche and urbanization in Cameroon: current status and secular trends. *Ann Hum Biol* 1999; 26(1):89-97.
27. Frisch RE, Revelle R. Height and weight at menarche and a hypothesis of critical body weight and adolescents events. *Science* 1970; 169:397-409.
28. Ersog B, Balkan C, Gunay T, Onag A, Ergema A. Effect of different social economic conditions on menarche in Turkish female students. *Early Hum Dev* 2004; 76(2):115-125.
29. Fakeye O. The interrelationships between age, physical measurements and body composition. *Int J Gynaecol Obstet* 1985; 23:55-88.
30. Lassek WD, Gaulin SJC. Menarche is related to fat distribution. *Amer J Phys Anthropol* 2007; 133(4):1147-1151.