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Age at menarche among school girls in Sokoto, Northern Nigeria

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Abstract

Background/Objectives: Menarche, the first menstrual period, is influenced by many factors including socio-economic status and rural or urban dwelling. The aims of the study were to compare the age at menarche between rural and urban girls and evaluate the anthropometric indices at menarche.

Materials and Methods: A cross-sectional study of rural secondary school girls and urban school girls. A structured questionnaire was used to obtain information on their age at menarche and other relevant data. Their weights and heights were measured using computerized scales and calibrated walls.

Results: Two hundred and twenty eight (228) rural girls and four hundred and eighty (480) urban girls that had attained menarche within a year were studied. Mean age at menarche for all the girls was 15.26 years. Mean menarcheal age for the rural and urban girls were 15.32 years and 15.20 years, respectively. Mean weight and height were 47.6 kg and 156.76 cm, respectively for the rural girls and 48.12 kg and 156.8 cm, respectively for the urban girls. There was no significance difference in age of menarche among the groups ($P > 0.05$).

Conclusion: The mean age at menarche for the school girls is 15.26 years. There was no difference in menarcheal age between the rural and urban school girls. Further longitudinal studies to compare rural school girls and urban school girls in private schools are required

Keywords: Menarche, schoolgirls

Résumé

Fond/objectifs: Premières règles, les premières menstruations, est influencée par plusieurs facteurs, y compris le statut socio-économique et logement rural ou urbain. Les objectifs de l'étude étaient de comparer l'âge au moment de l'apparition des premières règles entre filles rurales et urbaines et d'évaluer les indices anthropométriques à l'apparition des premières règles.

Des matériaux et des procédés: Une étude transversale des filles de l'école secondaire rurale et les filles de l'école urbaine. Un questionnaire structuré a été utilisé pour obtenir des informations sur leur âge à l'apparition des premières règles et autres données pertinentes. Leur poids et les hauteurs ont été mesurées à l'aide d'échelles informatisées et étalonné les murs.

Résultats: Filles rurales deux cent vingt huit 228 et quatre cent quatre-vingts 480 des filles urbaines qui avaient atteint l'apparition des premières règles dans l'année ont été étudiées. L'âge moyen à l'apparition des premières règles pour toutes les filles était 15.26 ans. Menstruées âge moyen pour les régions rurales et urbaines filles étaient ans 15,32 et 15.20 ans, respectivement. Hauteur et le poids moyen étaient 47,6 kg et 156.76 cm, respectivement pour les filles rurales et 48,12 kg et 156,8 cm, respectivement pour les filles urbaines. Il n'y n'avait aucune différence de signification dans l'âge d'apparition des premières règles parmi les groupes ($P > 0,05$).

Conclusion: L'âge moyen à l'apparition des premières règles pour les filles de l'école est 15.26 ans. Il n'y n'avait aucune différence d'âge menstruée entre les filles de l'école rurale et urbaine. Outre les études longitudinales de comparer les filles rurales et urbaines filles dans des écoles privées sont requis.

Mots clés: Apparition des premières règles, écolières

Introduction

Puberty is a period of human development during which secondary sexual characteristics appear, skeletal growth spurt occurs, behavioural attitudes are modified and the capacity for fertility is realised.^[1-4]

Undoubtedly the most striking event in the whole process of female puberty is the onset of menstruation.^[5] Menstruation is an important and much valued event in the reproductive life of most women particularly Nigerian women.^[6] Menarche the first menstrual period is only a single event in the transition to reproductive capability that occurs at puberty, however, it is the most dramatic and therefore more easily remembered than thelarche and puberarche.^[5,6]

Numerous factors have been shown to influence the age at menarche. These include genetic factors and birth weight. The transforming growth factor alpha gene is thought to control the onset of puberty.^[2,3,7] The percentage of body fat is thought to play a critical role. This is dependent on nutritional status and socio-economic status. The higher the nutritional status, the higher the percentage of body fat and the earlier the age of menarche.^[2,8] Other factors affecting age at menarche include birth order, family size, environment, diet, altitude, blindness, and general state of health.^[9-13] For instance, high altitude and chronic illnesses like sickle cell anemia may raise the age of menarche, while the converse is true for blindness.

In Australia, girls from the lower socio-economic status had a high mean menarcheal age of 13.99 years compared to their counterparts with high socio-economic status who had an age of 9.61 years. In this series however, it was discovered that girls of a higher socio-economic class tended to report a lower age of menarche than was actually true.^[14]

In Cape Town, South Africa, girls of higher socio-economic status had an earlier age of menarche of 12.61 years compared to 13.30 years for other South African girls.^[15] Adedavoh *et al* in Ghana also found the mean age of menarche to be 13.98 ± 1.42 years with a significant difference in terms of socio-economic class of their parents, ethnic group, educational institution, and home living areas.^[16]

In Nigeria, Abioye^[17] in 1997 and Fawole^[18] *et al* in 2002 found the mean age of menarche in Ibadan school girls to be 13.82 years with a significant difference in terms of social class.^[18] Both found a higher age at menarche for girls from the low socio-

economic group and a lower age for those from the high socio-economic group. The latter group of girls had a better weight, height, and body mass index than those of their low-income class counterparts.

From the aforementioned studies, it is obvious that there is a need for periodic assessment of the menarcheal age within each individual population so that the trend of change can be accurately documented. Despite the numerous studies which have been undertaken on menarche in Nigeria, we are not aware of such a study comparing the rural and urban populace in Sokoto State.

Sokoto State is in the far North West Zone of Nigeria. The Northwest zone of Nigeria has some of the most depressing socio-economic and health indicators. About 77% of the population lives below the poverty line,^[19] only 22% of the females aged 15 years and above are literate.^[20] The median age of marriage for girls is 14.6 years and the total fertility rate in the region is 6.531. On the contrary, the ratio of population per public sector health worker is the highest in the country with 3,756 per person as compared to the national average of 2,924 per person.^[21]

The objectives of this study were to determine the menarcheal age of the school girls, compare ages of the rural school girls with those of urban school girls and to determine the anthropometric measurements at menarche.

Materials and Methods

A list of all the secondary schools in Sokoto State was obtained from the Ministry of Education. There were only 2 existing girls- schools in the rural areas, all of which were boarding schools and government owned. The 2 schools were selected (Rabah and Illela). Comparable girls only schools located in the urban area were selected at random. Written approval for the study was gotten from the state Ministry of Education.

The study period lasted from 2nd – 20th April 2007 for the rural girls and 2nd-14th March 2009 for the urban girls. All the students in the schools were interviewed and screened after obtaining informed consent. Those who attained menarche within the last twelve months were selected and finally used for analysis. A period of 12 months was chosen to minimize error of recall and bias in terms of dates and anthropometric measurements.

A structured questionnaire was individually administered to all the girls. It represented information on date of birth, ethnicity, religion,

place of residence, menarcheal age, menstrual cycle, location of previous schools attended, and parents educational status and occupation. Social class was also determined based on an average socio-economic status of both parents using Oyedeji's method.^[22]

Their weights were then measured in kilograms using computerized scales with the girls dressed only in their light cotton uniforms. Standard heights were measured without headgear and footwear and with the two heels against the calibrated wall.

Data analysis was performed using Epi-info statistical software version 3.3.2 of 2005. Tests of association where applicable were performed using the chi-square, and the analysis of variance (ANOVA) test with a level of significance of 0.05.

Results

A total of 711 rural school girls were interviewed out of which 177 were yet to attain menarche and 366 had attained menarche for more than 12 months. Only 228 had started menstruating within the last

12 months. Among the urban girls, 1150 were interviewed of which 271 were pre menarcheal and 399 had been menstruating for more than one year. Only 460 had started menstruating within the last one year further analysis was limited to these 228 respondents in the rural group and 460 respondents in the urban group [Tables 1 and 2].

Almost all the rural girls (91.7%) belonged to the middle and low social class 3 to 5 while 80.9% of the urban girls were in similar classes. The age at menarche did not differ significantly ($P > 0.05$) between the social classes.

Discussion

In this study, the mean age of menarche for all the girls was 15.26 years. This is significantly higher than the current age of menarche of 13.82 – 14.8 years reported from recent series in Nigeria.^[18] It is also higher than the age of menarche reported in Nigeria more than 50 years ago, which is 14.50 years. Infact it is higher than the age of menarche for girls living in slums and rural areas in Mozambique^[23] and Cameroon,^[24] which are 14.51 and 14.27 years.

The high age of menarche is not surprising however bearing in mind the influence of nutrition and standard of living on menarche, so it may probably be a mirror as to the low socio-economic status of these areas.

The mean menarcheal age was found to be 15.32 ± 2.1 years for rural school girls and 15.20 ± 1.21 for urban school girls. Interestingly, although the menarcheal age was higher (15.32) in the rural than in the urban girls (15.20), the difference was not statistically significant ($P > 0.05$).

Possible explanations could be that despite the fact the urban girls were currently residing in an urban area now they may have been exposed to similar living conditions as their rural counterparts for most part of their lives. This was supported by the finding that 22% of the urban school girls were born and bred in the rural area. Furthermore, most (80.9%) of the urban girls were in social class 3 to 5, while about 91.7% of the rural girls were

Table 1: Biophysical features of respondents

No. of Respondents	Rural	Urban
Mean age at Menarche (Years)	15.32±2.1	15.20±2.1
Lowest age of Menarche (Years)	11	11
Highest age of Menarche (Years)	18	18
Model age of Menarche	14	15
Median age at Menarche	16	15
Mean Weight at Menarche (Kg)	47.6±5.9	48.12±8.5
Mean Height at Menarche (CM)	156.76±5.4	156.8±8.9
Mean Body Mass Index (BMI)	19.43±1.0 kg/m ²	19.55±1.0 kg/m ²
Shortest Menstrual Flow (Days)	1	1
Longest Menstrual Flow (Days)	9	9
Mean Duration of Flow	4.56±1.4	4.3±1.26

Table 2: Distribution of social class and age at menarche

Social Class	Frequency Rural	Frequency Urban	% Rural	% Urban	Age at Menarche (Years) Rural	Age at Menarche (Years) Urban
i	0	37	0	8	15.3	15.08
ii	19	51	8.3	11.1	15.37	15.08
iii	89	245	39	53.3	15.2	15.25
iv	9	82	39	17.8	15.41	15.6
v	31	45	13.6	9.8	15.12	15.25
Total	228	460	100	100		

in the same classes, therefore their socioeconomic statuses may be similar. Additionally, perhaps the majority of parents in the high socioeconomic classes may have sent their wards to private schools rather than government-owned schools. This was supported by the fact that only 19.1% of the urban school girls were in social class 1 and 2. Other factors that affect the age at menarche may also have contributed to this lack of difference in the two study groups.

The mean weight at menarche in this series was similar in both the rural and urban girls that is 47.69 ± 5.9 kg and 48.12 ± 8.5 kg. This is similar to 47.4 found by Fakeye^[8] in Ilorin, 47.1 shown by Ekele^[11] in Jos and 47.5 shown by Mocanu^[20] *et al.* It is been shown that despite deceleration in the age of menarche over the years, the body weight at which menarche occurs may remain unchanged. However, this critical weight hypothesis has been reviewed by some. They suggest the percentage of body fat rather than absolute weight was found to correlate better with pubertal development and reproductive competence.^[8,14]

A mean height of about 156.8 cm was found in both groups in this study. This is similar to the height for girls in Ilorin but lower than 158.15 for the Jos girls.^[11]

There were no girls of social class 1 amongst the rural school girls and only 8% of those in the urban group belonged to that class. The majority of girls belonged to socio-economic class III – V. This further buttresses the poor living standards of these girls. From this study, there is no significant difference in the age of menarche among the various socio-economic classes as the age of menarche was fairly constant at 15 years. Perhaps if there were even distribution in all the social classes, a difference may have been noticed. Similar observations had been made by earlier workers.^[5,20] It has been suggested that factors other than socio-economic status and anthropometric data may have a greater influence on the age at menarche. However, Oduwole *et al* in Lagos^[21] in their series found a significant difference in age of menarche among the various social classes. The number of subjects and study design could be responsible for some of these variations.

In conclusion, the age at menarche for the school girls was 15.26 years. It was 15.32 years and 15.20 years for the rural and urban girls, respectively. There was no significant difference in the age at menarche between the rural and urban school girls. The girls were from similar socioeconomic statuses. Another study between urban school girls in private schools and the rural girls may provide more information.

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