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ASSESSMENT OF AGE AT MENARCHE OF NIGERIAN URBAN SCHOOL GIRLS

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ABSTRACT:

Age at menarche varies with time of onset and the influence of social factors depends on the population under consideration. The objective of the present study was to determine the age at menarche among secondary school girls in Benin City, Nigeria and identify some of the social factors that might influence it. In this cross sectional study information on age at menarche was obtained from 1,640 menstruating secondary school girls (aged between 10 and 20 years) using the status quo method. Information sought in the structured questionnaire used included date of birth, date of menarche, educational attainment and occupation of parents, birth position, family size and State of origin. Data was analyzed using SPSS version 12.0. The mean age at menarche was 13.44 ± 1.32 years (95% Confidence Interval, CI= 13.36-13.50). One out of every 15 (6.7%) girls below 12 years of age had attained menarche, indicating early menarche. There was statistically significant relationship between the mean menarcheal age and socioeconomic status ($p < 0.001$), birth position ($p < 0.01$) and family size ($p < 0.01$). The current mean age at menarche among secondary school girls in Benin City is 13.44 ± 1.32 years and it is influenced by socioeconomic status, birth position and family size.

Key words: Age, menarche, urban, schoolgirls, Nigeria.

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INTRODUCTION:

Menarche (the first menstrual bleeding of a female [1]) represents the endpoint of a complex sequence of events that characterize sexual maturation and puberty in girls [2]. It is unique, and probably, the most accurately recallable indicator of puberty among girls and a widely used indicator of adolescence sexual maturation [3,4]. Variations in age at menarche between individuals and populations have been documented [5-7]. It is influenced by social, environmental and genetic factors [5-9].

The mean age at menarche varies from one population to another; in Iran it was 12.91 ± 1.23 years [10], in South Africa 12.75 ± 1.32 years [8], in India 13.18 ± 1.08 years [9], and in Kenyan 12.5 ± 2.8 years [11]. Within Nigeria, similar variations in age at menarche have been observed; 13.98 ± 1.30 years in the West [12], 13.03 ± 1.02 years in the East [13], and 13.50 ± 1.33 years in the North [14]. A study involving one secondary school in Benin City, Nigeria reported a mean age at menarche of 13.16 ± 1.22 years [15]. In both developing and developed countries, some studies have reported a decline in the average age at menarche [16-19]. This trend towards a reduction in the average age of menarche has been attributed to improvement in living standard and nutrition [1]. On the other hand, in some countries, this downward trend seems to have come to a halt [20]. In view of the

reported secular trend, there is a need to monitor the age at menarche. Data on age at menarche are useful in health planning, establishment of adolescent health centres and improvement in health promotion services for girls [21]. In addition, contemporary issues such as introduction of sex education in Nigerian schools require knowledge of the age at menarche as well as the sequence of events of puberty; menarche being the last in this sequence.

An early age at menarche is associated with an increased risk of some clinical conditions, such as breast cancer [22], obesity [23], endometrial cancer [24], and uterine leiomyomata [25]. Some studies have indicated that women who attained menarche at the age of 11 years and below have a higher risk of development of breast cancer than those who attained menarche at the age of 12 years and above [26,27]. Late menarcheal age is thought to protect, at least to some extent, women in Sub-Saharan Africa from breast cancer [28]. In this regard, the observed trend towards a reduction in the average age at menarche in West African countries (Nigeria inclusive) portends some danger as it relates to occurrence of breast cancer [13,14]. In addition, there are indications in the literature that the age at menarche might be related to subsequent reproductive performance, such as the age at first intercourse, the age at first pregnancy and

risk of subsequent miscarriage [29]. From the foregoing, it is obvious that there is a need to monitor closely the average age at menarche in Nigeria. Majority of the Nigerian studies that focused on age at menarche were conducted several years ago [12-14].

The objective of the present study was to determine the age at menarche among secondary school girls in Benin City, Nigeria and identify some of the social factors that might influence it.

PARTICIPANTS AND METHODS:

This cross-sectional study was conducted among adolescent girls in two public secondary schools in Oredo Local Government Area (OLGA), Edo State, Nigeria. According to the Edo State Ministry of Education Statistics, there are nine public secondary schools in the local government area (LGA), comprising three co-educational, two boys and four girls' schools [30]. Consent for the study was obtained from the school authorities and from the parents. Two of the four girls' secondary schools were randomly selected. The student population of each of the two schools selected was 1,394 and 772, giving a grand total of 2,166, which represents the study population.

During data collection the girls were informed about the relevance of the study and the need to accurately fill the questionnaire without including their names, and that their participation was voluntary. Data was collected

between October and November 2011, using a structured questionnaire designed by the authors. The questionnaire was pre-tested on 30 girls of the same age group in another all girls' school within the same LGA. Information sought in the questionnaire included: date of birth, date of onset of first menstrual bleeding, birth position among their siblings, family size (number of siblings), State of origin, level of education and occupation of both parents/guardian.

The family size was categorized into small size (no sibling or one or 2 siblings); medium size (3 or 4 siblings); large size (5 or more siblings). The socio-economic status of the parents was determined using the classification suggested by Ogunlesi et al [31]. This was analyzed via combining the highest educational attainment, occupation and income of the parents (based on the current mean income of each educational qualification and occupation in Edo State, Nigeria). In this Social Classification System, Classes I and II represent the high social class, Class III represents the middle social class, and Classes IV and V represent the low social class. In this way, the girls were categorized into high, middle and low socio-economic classes.

The data was analyzed using the SPSS (Statistical Package for Social Sciences), version 12.0.

RESULTS:

Seven girls declined to participate, thus the response rate was 99.7%. The questionnaires of 9 girls were excluded from the analysis because they were incompletely filled, thereby leaving a total of 2,150 (99.6%) questionnaires for data analysis. Girls in both schools had similar socio-demographic characteristics, thus analysis of data was carried out for the combined group of girls.

Of the 2,150 girls, 1,640 (76.3%) had attained menarche at the time of the study. Analysis of

the questionnaire of the 1,640 girls showed that the mean age at menarche was 13.44 ± 1.32 years (95% Confidence Interval, CI= 13.38-13.50). One out of the 15 (6.7%) girls who were below 12 years of age had attained menarche, indicating early menarche (Table 1).

The mean age at menarche was significantly higher in the low socioeconomic class compared to the high socioeconomic class (Table 2). Girls from the high socioeconomic class attained menarche 8.0 and 9.0 months earlier than the girls from the middle and the low socioeconomic classes respectively.

Table 1: Distribution of the girls according to their age at menarche

Age in Years	Total number of girls	Number (%) that attained menarche
10	2	0 (0)
11	13	1 (7.7)
12	109	16 (14.7)
13	296	95 (32.1)
14	356	218 (61.2)
15	380	337 (88.7)
16	490	471 (96.1)
17	315	313 (99.4)
18	112	112 (100.0)
19	62	62 (100.0)
20	15	15 (100.0)
Total	2150	1640 (76.3)

Table 2: Socioeconomic status and mean age (years) of the girls at menarche

Age at menarche (years)	Total number that attained menarche	Socioeconomic status (SES)		
		High N (%)	Middle N (%)	Low N (%)
10	0	0 (0.0)	0 (0.0)	0 (0.0)
11	1	1 (9.1)	0 (0.0)	0 (0.0)
12	16	10 (62.5)	6 (37.5)	0 (0.0)
13	95	47 (49.5)	38 (40.0)	10 (10.5)
14	218	106 (48.6)	95 (43.6)	17 (7.8)
15	337	31 (9.2)	176 (52.2)	130 (61.4)
16	471	8 (1.7)	143 (30.4)	320 (67.9)
17	313	2 (6.5)	16 (5.1)	295 (88.4)
18	112	0 (0.0)	13 (11.6)	99 (88.4)
19	62	0 (0.0)	57 (91.9)	5 (8.1)
20	15	0 (0.0)	12 (80.0)	3 (20.0)
Total	1640	205 (12.5)	548 (33.4)	887 (54.1)
Mean age (95%CI)	13.44±1.32 (13.38-13.50)	12.78±1.21 ^a (12.61-12.95)	13.42±1.18 ^b (13.32-13.52)	13.56±1.29 ^c (13.42-13.59)
t-statistic (p-value)		a vs b =4.41 (<0.01)	b vs c=2.08 (>0.05)	a vs c=7.95 (<0.001)

As shown in Table 3, first-born girls attained menarche earlier than latter-born girls with first-born girls attaining menarche 8.0 months earlier than eight-born girls. Of the 1,640 girls, 8 (0.5%) were the only child in their family and the mean age at menarche was 12.80±1.11 years (95% CI= 12.03-13.57). Table 4 shows

the mean age at menarche according to family size. Girls from small-size families attained menarche 4.0 and 7.0 months earlier than their counterparts from medium-size and large-size families respectively. Based on state of origin, the mean age at menarche did not differ.

Table 3: Birth position and mean age (years) of the girls at menarche

Birth position	Total number that attained menarche	Mean age (yrs) at menarche	Age 95% CI
1 st	437	13.02±1.22	12.91-13.13
2 nd	333	13.04±1.09	12.92-13.16
3 rd	323	13.14±1.12	13.02-13.26
4 th	164	13.30±1.23	13.11-13.49
5 th	77	13.52±1.19	13.25-13.79
6 th	33	13.53±1.38	13.06-14.00
7 th	38	13.65±1.40	13.21-14.10
8 th	27	13.68±1.43	13.14-14.23
Total	1640	13.44±1.32	13.38-13.50

Table 4: Family size and mean age (years) of girls at menarche

Family size	Number (%) that attained menarche	Mean age (yrs) at menarche	Age 95% CI	t-statistic (p-value)
Small size	221(13.5)	13.09±1.31 ^a	12.91-13.26	a vs c: t=4.82 (<0.01)
Medium size	1063 (64.8)	13.41±1.28 ^b	13.33-13.49	a vs b: t=3.32 (<0.05)
Large size	356 (21.7)	13.64±1.37 ^c	13.50-13.78	b vs c: t=2.79 (<0.05)
Total	1640 (100.0)	13.44±1.32	13.38-13.50	

DISCUSSION:

The mean age (13.44 years) at menarche obtained in the present study in Edo State was comparable to 13.43 years reported from Port Harcourt among urban school girls [32] but lower than 14.22 years reported among rural school girls in Etche (both in Rivers State, Nigeria) [33]. The lower mean menarcheal age in the present study might be explained by

differences in socio-demographic factors. In the present study the girls were urban school girls while in the study in Etche they were rural school girls. The report of a study in Plateau State, Nigeria indicated that rural school girls tend to achieve menarche at an older age than urban school girls [14]. In contrast, Goon et al [34], reported that the age at menarche was comparable between urban and rural girls.

They attributed this parity to improved living conditions among their rural population. It is important to note that the methods of collecting and analyzing data vary from one study to another, indicating the need to exercise caution when comparing age at menarche in different studies.

Our current result indicated that one out of every 15 (6.7%) girls below 12 years of age attained menarche. This is similar to the findings reported from Wannune, Benue State, Nigeria but with higher prevalence rates of 16.4% and 37.0% at 10 and 11 years of age respectively [34]. A previous study in Benin City alluded to occurrence of early menarche in their study but the prevalence was not indicated [15]. The clinical implication is that this small group of girls with early menarche might be at increased risk of breast cancer, obesity, endometrial cancer and uterine leiomyomata [22-25], thus the need to advocate for them to be closely monitored. In addition, Schor reported that the age at menarche might be related to the age at first sexual intercourse [29], which may result in unwanted teenage pregnancy with its attendant risks. The suggested practical solution is that sex education in Nigerian schools should be started early, well before the age of 12 years.

As in previous studies in Nigeria [12-15], socioeconomic status (SES) of the parents influenced their daughters' age at menarche. According to our results, girls belonging to the high socioeconomic class attained menarche 9

months earlier than their counterparts in the low socioeconomic class. This finding is comparable to the 8.5 months difference reported in a previous study in Nigeria [13]. On the other hand, the observed difference in the present study is lower than the 11 and 12 months reported in two previous studies in Nigeria [15,35].

Our result indicates that the first and early born girls tend to attain menarche at an earlier age than their counterparts who were born latter or were last born. A similar observation has been reported in a previous study [15]. There is no readily available explanation for this observation. However, it has been speculated that there is usually more pressure and expectation on the first-born girls to achieve, forcing them to mature faster than latter-born girls. It is, therefore, thought that this early attainment of maturity in first-born girls, make them attain menarche at an earlier age compared to their latter- born siblings.

Our result supports the reports by others [36], that girls from small-size families tend to attain menarche at a younger age than girls from large-size families. Family size may exert its effect on age at menarche through concealed poverty because the larger the family size the lower the income per capita. This effect is likely to be more pronounced in societies with low socioeconomic status.

In conclusion, the current mean age at menarche in Benin City was 13.44 years; it is

influenced by social factors such as socioeconomic status, birth position and family size.

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