

Menarcheal age in Ghanaian school girls

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Abstract

In a cross-sectional retrospective study of 2087 Ghanaian school girls in various educational institutions in the Kumasi district, Ashanti region, Ghana, the mean menarcheal age was found to be 13.98 ± 1.42 years. Differences in the menarcheal age of the girls was found to be significantly correlated to social class, parents ethnic origin, educational institution and home living area ($P = 0.0001$). The duration of the menarche and the interval between the menarche and the second period was found to be influenced by the age at menarche ($P < 0.01$). Decline in menarcheal age in concurrence with world trends was observed. Further studies are necessary to identify the inherent and specific factors in the Ghanaian population which relate to and influence the age of menarche.

Keywords: Menarche; Cross-sectional study; Ghanaian school girls.

Introduction

The age of puberty represents a very critical time in the life history of every young woman. The period is accompanied by a number of important physical, mental and developmental changes including menarche, the onset of menses. Again, the timely

appearance of the menarche gives assurance that other less recognizable features of puberty are developing normally. Physicians in Ghana are often asked by concerned parents whether the menarche of their daughter is abnormally late or early. No serious study, however, has been done to establish the normal age period of the inception of menstruation in the Ghanaian girl, even though it is generally known that menstruation takes place at some time during the second decade of life.

The purpose of this retrospective study was to determine the average age of menarche in Ghanaian girls and any geographic, social and economic factors that may affect that age.

Subjects and Methods

In February 1986, a total of 2095 twelve-point questionnaires were distributed to ten schools (five secondary schools, two teachers training colleges, one nursing/midwifery training college, one post-elementary vocational institute, and one university college) in the Kumasi district, of the Ashanti region, Ghana. The relevant data on the questionnaire were: date of birth; present age; educational institution; home town and region; father's occupation; parent's ethnic group, age at menarche; duration of menarche and interval between commencement of menarche

and the second period. The girls who did not know or were in doubt of the correct answer to a particular question or questions were instructed to omit answering that particular question or questions. Social class was categorized according to their fathers' occupations using the British Registrar General's classification. Of the 2095 questionnaires distributed 2087 (99.62%) were returned answered. The respondents ranged in age from 10 to 49 years.

Results

Mean age

The mean age of the girls in the study was 19.18 years \pm 5.00 S.D. The mean interval between the menarche and their age at the time of completion of the questionnaire was 5.66 \pm 4.80 years.

Mean menarcheal age

The mean age of the menarche was 13.98 years \pm 1.42 S.D. The distribution of the mean menarcheal age by parent's ethnic group, social class, educational institution, and home living area is shown in Tables I—IV, respectively. Table V shows the mean menarcheal age for the girls born between 1946—1955, 1956—1965, and 1966—1976, respectively. There was a statistically significant decline in the mean menarcheal age in these three decades, namely a decline of 7.3 months (0.61 years) between 1946—1955 and 1956—1965, and 5.45 months (0.45 years) between 1956—1965 and 1966—1976 birth groups, respectively ($P = 0.039$).

Statistical analysis

Utilizing mean menarcheal ages of variable groups and frequency distribution of respon-

Table I. Mean menarcheal age by parents ethnic group.

Ethnic group*	Mean menarcheal age (years \pm S.D.) (by father's ethnic group)	Mean menarcheal age (years \pm S.D.) (by mother's ethnic group)
GA	13.43 \pm 1.35 ($N = 90$)	13.26 \pm 1.44 ($N = 103$)
F	13.55 \pm 1.41 ($N = 254$)	13.63 \pm 1.41 ($N = 257$)
AS	14.11 \pm 1.35 ($N = 1119$)	14.10 \pm 1.37 ($N = 1120$)
AKW	13.51 \pm 1.30 ($N = 52$)	13.70 \pm 1.32 ($N = 49$)
AKI	14.05 \pm 1.5 ($N = 48$)	13.91 \pm 1.22 ($N = 54$)
KW	14.14 \pm 1.68 ($N = 49$)	14.28 \pm 1.51 ($N = 55$)
AKM	15.39 \pm 0.95 ($N = 4$)	13.37 \pm 1.85 ($N = 4$)
E	13.84 \pm 1.32 ($N = 117$)	13.88 \pm 1.44 ($N = 91$)
B	14.39 \pm 1.85 ($N = 59$)	14.50 \pm 1.63 ($N = 62$)
N	14.47 \pm 1.55 ($N = 79$)	14.51 \pm 1.49 ($N = 78$)
Not stated	14.15 \pm 1.38 ($N = 26$)	13.96 \pm 1.47 ($N = 26$)

*GA = Ga-Adangbe; F = Fante; AS = Ashanti; AKW = Akwapim; AKI = Akim; KW = Kwahu; AKM = Akwamu; E = Ewe; B = Brongs; N = Notherns.

Table II. Mean menarcheal age by social class.

	Social class				
	1 (N = 273)	2 (N = 616)	3 (N = 926)	4 (N = 3)	Others* (N = 113)
Mean menarcheal age (years \pm S.D.)	13.26 \pm 1.44	13.85 \pm 1.37	14.30 \pm 1.37	14.33 \pm 0.42	13.81 \pm 1.39

*Others = Fathers (pensioned, retired or deceased) whose previous occupations were not stated and expatriates.

ses, an analysis of variance (ANOVA) was carried out with Chi-square analysis. The results of analysis of variance (ANOVA) with menarcheal age as the dependent variable and father's ethnic group, mother's ethnic group, social class, educational institution and home living area as predictor variables show that these predictor variables explained to a significant extent the variation in menarcheal age among the girls ($P = 0.0001$). The results of ANOVA with menarcheal age as the predictor variable and duration of menarche and interval between menarche and second period as dependent variables show that the menarcheal age explained a significant amount of the variation in the number of days the menarche lasted and the number of days between the menarche and the second period ($P < 0.01$).

Discussion

In this first major survey to determine the age of menarche of Ghanaian girls, the mean menarcheal age was found to be 13.98 ± 1.42 years. The mean duration of the menarche was 4.79 days with 64.42% of the girls having had the normal duration of 3–5 days. The mean interval between the menarche and the second period was 65.05 days with 41.68% of the girls having had the normal interval of 26–30 days. Wilson and Sutherland [18] found in 1953 a mean menarcheal age of 14.4 years in Nigeria as a whole. Akingba [1] in a 1968 National survey of 1728 females put the age at menarche of Nigerians at 13.95 ± 1.17 years whilst Sogbanmu and Aregbesola [11] in a study in 1979 arrived at a mean menarcheal age of 13.85 years among Nigerians. Table VI

shows for the purpose of comparison the mean menarcheal age of other Africans.

Among Ghanaians the lowest mean menarcheal age (< 13.00 years) by parents ethnic group occurred among the Ga-Adangbes, Fantes, Akwapims and Ewes (Table I). The other ethnic groups which inhabit the middle and northern parts of Ghana have a higher mean menarcheal age (> 14 years). The difference in menarcheal age by parental ethnic group was statistically significant ($P = 0.0001$). The reasons or factors that are responsible for this difference are not clear. However, the four ethnic groups with the lowest menarcheal ages are southern Ghana ethnic groups. It is possible that these differences may be related to differences in nutritional and dietary habits, stature and physique, general health status and questionably climatic conditions. Southern Ghana is a forested region, while northern Ghana is dry, savannah country. Nutrition is generally considered better in the south. Earlier studies suggested an accelerating or retarding influence of geographic locations and general climatic conditions on the menarcheal age [14]. Bojlen and Bentzon, however, observed that climate per se had little or no effect on the age of menarche [2]. Sogbanmu and Aregbosola confirmed in their study of Nigerian girls that physical build and body weight rather than climate, are factors which influenced the menarcheal age [11]. The influence of genetic or hereditary factors has also been mentioned in some of the literature [7].

Although current observations in Western industrialized countries do not confirm it [6,10] the suggestion was made in earlier

Table III. Mean menarcheal age by education institution.^a

	A (N = 24)	B (N = 234)	C (N = 363)	D (N = 96)	E (N = 132)	F (N = 198)	G (N = 206)	H (N = 138)	I (N = 211)	J (N = 329)
Mean menar- cheal age (years ± S.D.)	12.08 ± 1.17	13.46 ± 1.17	13.74 ± 1.15	13.95 ± 1.01	14.01 ± 1.15	14.26 ± 1.34	14.89 ± 1.03	14.67 ± 1.37	15.00 ± 1.46	13.09 ± 1.38

^aSecondary schools, A, B, C, D, E; Post-secondary schools, G, H, I; University, J; Vocational institute, F.

Table IV. Mean menarcheal age by home living area.

	Home living area			
	Urban (<i>N</i> = 1216)	Suburban (<i>N</i> = 252)	Rural (<i>N</i> = 186)	Not stated (<i>N</i> = 277)
Mean menarcheal age (years \pm S.D.)	13.74 \pm 1.36	14.47 \pm 1.63	14.75 \pm 1.28	14.07 \pm 1.28

studies that menarcheal age and socio-economic class had an inverse proportional relationship [3,14]. A statistically significant relation between menarcheal age and socio-economic class is found in this particular study ($P = 0.0001$). The children of the most affluent in social class 1 have the lowest menarcheal age (13.26), whilst those whose parents belong to social class 3 had a higher menarcheal age (14.30 years) (Table II). It seems therefore that among Ghanaian girls the socio-economic status still influences the menarcheal age. This could be attributed to better nutrition and hence earlier maturation of the girls in the higher socio-economic bracket.

The influence of social class is also reflected in a statistically significant difference in the mean menarcheal age in different educational institutions (Table III). School A is an exclusive and expensive international school. The mean menarcheal age was 12.08 years followed by the mean menarcheal age (13.09 years) of the university students (J) who also enjoy on the average a relatively high affluent parentage. Likewise schools B—E, with mean menarcheal ages of 13.46, 13.74, 13.95, and 14.01 years, respectively are secondary schools serving persons in a more

affluent socio-economic class. Schools, F, G, H, I, with means of 14.89, 14.26, 14.67, and 15.00, respectively, are post-elementary vocational training (F), nursing/midwifery training (G), and teacher training (H, I) schools, respectively, with students generally from the lower social classes.

The home living area showed a statistically significant influence in the variation in menarcheal age of the girls ($P = 0.0001$). Girls who grew up in urban areas had the lowest mean menarcheal age of 13.74 years, whilst girls who grew up in suburban and rural areas had mean menarcheal ages of 14.47 and 14.75, respectively (Table IV). Comparative studies on rural and urban girls have shown that urban girls mature and menstruate earlier than their rural counterparts [14]. Teklewold et al. [16] also found a mean menarcheal age of 13.68 years in urban Ethiopian girls as compared to a mean menarcheal age of 14.58 years found among rural Ethiopian girls by Haile and Roth [8].

In concurrence with current studies in Europe, and the United States which indicated a gradual lowering trend in the menarcheal age [12,13,15], our study showed a statistically significant decline in menarcheal age between 1946 and 1976 — a decline of

Table V. Mean menarcheal age: 1946—1955, 1956—1965, 1966—1976.

	1946—1955 (<i>N</i> = 41)	1956—1965 (<i>N</i> = 784)	1966—1976 (<i>N</i> = 1092)
Mean menarcheal age (years \pm S.D.)	14.72 \pm 1.30	14.11 \pm 1.30	13.66 \pm 3.24

Table VI. Comparative menarcheal age among other Africans.

Country	Mean menarcheal age (years)	Authors	Year
Nigeria	14.3	Elis [4]	1950
Nigeria	14.4	Wilson and Sutherland [18]	1953
Nigeria	13.95	Akingba [1]	1968
Nigeria	13.85	Sogbannu M.O. Aregbesola [11]	1979
Senegal	14.09	Wilson and Sutherland [18]	1953
Ethiopia	13.68 (urban)	Teklewold et al. [16]	1972
	14.58 (rural)	Harie and Roth [8]	1984
Ghana	13.74 (urban)	Adadevoh et al.	1986
	14.75 (rural)		

12.75 months (1.06 years). Pressor Harriet estimated the decline in the menarcheal age to be about a year per generation [9]. Tanner [12] and Eveleth and Tanner [5] had observed a fairly constant decline of about 0.33 years per decade since the beginning of this century. Our study showed a decline of 0.61 years and 0.45 years between the decades 1946—1955 and 1956—1965, and 1956—1965 and 1966—1976, respectively (Table V). This decline in menarcheal age was statistically significant ($P = 0.039$).

In conclusion, the age of menarche in a Ghanaian population appears to be related to social status, ethnic origin and geographic location. The exact nature of these relationships require further studies.

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