ACTA PÆDIATRICA
NURTURING THE CHILD

Acta Pædiatrica ISSN 0803–5253

REGULAR ARTICLE

# Menarcheal age among urban Kenyan primary school girls

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**Keywords**
Early menarche, Kenya, menarcheal age

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**Received**
20 August 2010; revised 14 December 2010; accepted 22 December 2010.

DOI:10.1111/j.1651-2227.2011.02152.x

## ABSTRACT

**Aim:** To determine the mean menarcheal age among urban primary school girls in Kenya.

**Subjects and methods:** A structured questionnaire was administered to 820 primary grade 6–8 girls aged between 12 and 17 years in five public primary schools, Langata division of Nairobi West district, Nairobi Kenya. The girls came from low and middle socioeconomic status residences. Declared menarcheal age by recall to the nearest month was recorded. Data were analysed using SPSS version 15.0 for windows. The results are presented using tables and bar charts.

**Results:** The mean menarcheal age was 12.5 ± 2.8 years with peak at 12–14 years. A substantial number of girls (10.8%) attained menarche before the age of 11 years, with 2% of them attaining it before 10 years. None attained menarche before nine or after 16 years. Of those who attained early menarche, 64.3% were from middle while only 35.7% came from low socioeconomic status residence, respectively.

**Conclusion:** Mean menarcheal age of 12.5 years is lower than previously reported with over 10% of the girls attaining menarche by 11 years. Early commencement of reproductive health education and follow-up for complications of early menarche is recommended.

## INTRODUCTION

Mean menarcheal age varies within and between countries probably depending on epigenetic and environmental factors (1). It is important in establishing baselines for determination of precocious and delayed puberty (2). In Africa, mean menarcheal age varies between 11.98 and 16.1 years (3,4). When first menstrual periods occur before 11 years, it is referred to as early menarche (2,5). This condition is associated with adverse life conditions and diseases (6–8). Its prevalence displays ethnic and intercountry variations (2,9). In Kenya, there are no definitive data on menarcheal age among primary school girls. This study therefore investigated the age of menarche among primary school girls in Nairobi, Kenya.

## SUBJECTS AND METHODS

A structured questionnaire was administered to all girls in primary grade 6–8 in five public primary schools in Nairobi West district of Nairobi city, Kenya. Participation in the study was voluntary. Authority and permission for the study were given by the Provincial Director of Education and the Head Teachers of the respective schools. The girls were asked to declare their menarcheal age from recall to the nearest whole month and indicate their residence at the time of menarche. Residential areas were divided into two broad categories namely low socioeconomic status (SES) [A] and middle SES [B]. Category A was slum residences with unpredictable income in which the average household income is <3 USD a day. Category B on the other hand included middle class residences in which the average net income exceeds 15 USD per day. Those who had not attained menarche or could not remember menarcheal age to the nearest whole month were excluded from the study. Menarcheal ages, in the respective SES groups, were recorded to the nearest 1 month. These ages were categorized into 1 year groups starting with 9 years. The data collected were analysed using SPSS version 15.0 Chicago Illinois to determine frequencies, means and median. The median age was determined to be 13 years. Using this median age, the girls were divided into two categories, those below 13 and those above 13 years. The difference between the two SES groups in distribution of menarcheal age with respect to the median age was determined using Chi-square at 95% confidence interval. p value of ≤0.05 was considered significant. Data are presented by tables and bar charts.

## RESULTS

Eight hundred and twenty girls (range 12–17 years) responded to the questionnaire. Two hundred and sixteen girls were excluded from the study: 176 had not attained menarche, and 40 could not remember their menarcheal age to the nearest month. Six hundred and four

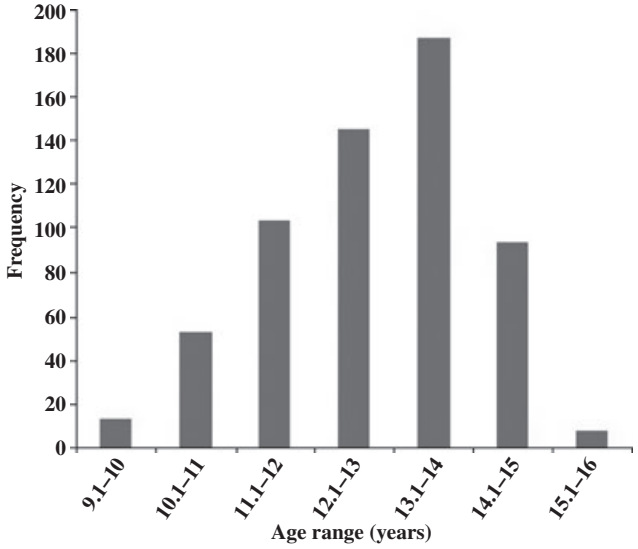


**Figure 1** Distribution of menarcheal age.

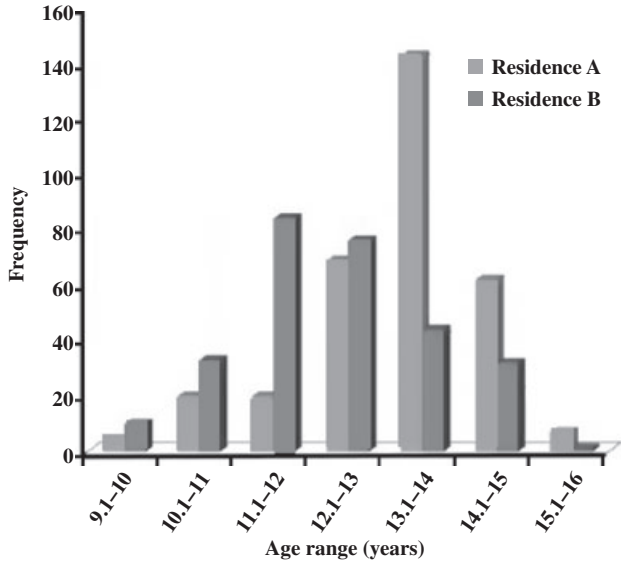


**Figure 2** Menarcheal age by residential area.

questionnaires were analysed. The mean age of menarche was 12.5 ± 2.8 years with a median of 13 years. Twelve girls (2%) attained menarche between 9.1 and 10.0; 53 (8.8%) between 10.1 and 11.0; 104 (17.2%) between 11.1 and 12.0; 145 (24.0%) between 12.1 and 13.0; 187 (31.3%) between 13.1 and 14.0; 94 (15.7%) between 14.1 and 15 and 7(1.1%) between 15.1 and 16.0 years. None of the girls attained menarche before 9 years or after 16 years. Sixty girls (10.8%) attained menarche by 11 years (Fig. 1).

Three hundred and twenty-four (53.6%) girls lived in category A residential areas. Of these, 3 girls attained menarche in their tenth; 20 girls in the 11th; 20 in their 12th; 69 in their 13th; 143 in their 14th; 62 in their 15th and 7 in their 16th year. The group mean menarcheal age was 12.7 years with a peak in the 14th year. Two hundred and eighty girls (46.4%) lived in category B residential areas. Of these, 10 girls attained menarche in their 10th year; 33 in the 11th; 84 in the 12th; 76 in the 13th, 44 in the 14th; 32 in the 15th; and 1 in their 16th year. The group mean menarcheal age was 11.8 years (Fig. 2). Using the median of 13 years as the comparison age limit, the difference between the two SES categories was statistically significant ($p = 0.047$).

## DISCUSSION

The mean menarcheal age of 12.5 years falls within the reported worldwide range of 12–17 years (1). It is lower than most of those reported in Africa including Kenya (16–18), but comparable to that of USA, Britain, Korea and Spain (Table 1). These wide variations may be because of epigenetic and environmental factors that influence menarcheal age (1). This lower age is concordant with literature reports that mean menarcheal age has been declining with time (19,20). This trend has been attributed to several chemicals in cosmetics, food preservatives, pesticides and hair products, which may be degraded into substances that modify female hormonal profile (21). The comparatively low menarcheal age in the present study may also be related to urbanization. Indeed, girls from urban environments attain menarche earlier than their rural counterparts (21).

Similar to literature reports, ten point eight per cent of the girls attained menarche by 11 years (2,22,23). Girls who attain menarche early are more likely to be depressed, aggressive, socially withdrawn, moody and sexually active with risk of early pregnancy, have more problems, smoke and use drugs in school (6,24) and to suffer increased risk of cardiovascular disease (7), breast and ovarian cancer (8). These childhood risks foreshadow adult diseases suggesting that this category of girls should be followed up for these diseases and that guidance and counselling on reproductive health should commence in lower primary school.

The observation that menstruation starts earlier among girls from higher SES backgrounds is concordant with literature reports (25–28) (Table 2). This may be related to more fat in the diet and better living conditions (19,26). Delayed onset of menstruation among girls from lower SES may be related to excessive leanness and growth stunting (29). A notable finding of the present study is that no girl suffered delayed menarche, that is after 16 years (30), implying that implicated causes such as excessive leanness, growth stunting and malnutrion (3,29) are not severe enough in the study population.

## CONCLUSION

Mean menarcheal age of 12.5 years is lower than previously reported with over 10% of the girls attaining menarche by 11 years. Early commencement of reproductive health education and follow-up for complications of early menarche is recommended.

**Table 1** Mean menarcheal age of various populations

| Author | Population | Country | Sample size (n) | Mean menarcheal age (years) |
|---|---|---|---|---|
| Simondon et al. (4) | African | Senegal | 1126 | 16.1 |
| Rebacz (10) | | Tanzania | 71 | 14.3 |
| Mbizvo et al. (11) | | Zimbabwe | 1689 | 13.5 |
| Mounir et al. (3) | | Egypt | 1606 | 11.98 |
| Current study | | Kenya | 604 | 12.5 |
| McDowell et al. (12) | Occidental and oriental | USA | 6788 | 12.8 |
| de la Puente et al. (13) | | Spain | 5472 | 12.31 |
| Hwang et al. (14) | | Korea | 1061 | 12.7 |
| Okasha et al. (15) | | Britain | 3433 | 12.5 |
| Rogo et al. (16) | High schools | Kenya | 434 | 13.9 |
| Rogo et al. (17) | Tertiary institutions | Kenya | 457 | 14.4 |
| Mulder (18) | Kipsigis community | Kenya | 317 | 14.9 |

**Table 2** Mean menarcheal age and socioeconomic status (SES)

| | | Mean menarcheal age | |
|---|---|---|---|
| Author | Country | High SES | Low SES |
| Braithwaite et al. (25) | Nigeria | 12.2 | 13.0 |
| Ofuya (26) | India | 12.2 | 13.0 |
| Onat and Ertem (27) | USA | 12.5 | 13.4 |
| Janqueira (28) | Brazil | 12.0 | 14.0 |
| Current study | Kenya | 11.8 | 12.7 |

**ACKNOWLEDGEMENTS**

We are thankful to the head teachers of relevant schools for permitting data collection and Catherine Chinga for typing the manuscript.

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