

Early menarche among urban Kenyan primary school girls

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Abstract

Background: Early menarche is associated with increased risk of developing gynecological cancer, cardiovascular and mental disease. Its prevalence shows ethnic and geographical variation, but there is barely any data from Kenya. Such data are important in informing school reproductive health programmes.

Objective: This study aimed at describing early menarche among primary school girls.

Methods: Two hundred and sixty two structured questionnaires were administered and analyzed to determine menarcheal age and its relationship with SES and academic performance among girls in 5 urban primary schools in Nairobi, Kenya.

Results: Over 10% of the girls attained early menarche, with 2% being under 10 years. Of these, 64.3% lived in middle class residential areas where parents earned at least 15 USdollars a day. The rest lived in lower SES residences with household income less than 1 US dollar a day. 53.8% of the early menarcheal girls compared to 21.8% of normal menarcheal girls experienced decline in academic performance.

Conclusions: Early menarche is a significant problem among urban primary school girls in Kenya especially those from higher income backgrounds and constitutes part of the causes of decline in academic performance. Further studies to identify the possible causes and mitigations including structured early reproductive health education as well as follow up of the victims for potential adverse health effects are recommended.

Key words: Early menarche, Kenya, Academic performance

Introduction

Early menarche is when first menstruation occurs before the age of 11 years (1,2). It is associated with early onset of sexual activity, pregnancy and child bearing (3) increased risk of cardiovascular disease (4), asthma (5), diabetes mellitus (6); increased maternal distress (7), breast cancer (8) obesity (9); increased risk of cancer of endometrium (10); ovary (11) and cervix (12). Its prevalence displays ethnic and intercountry variations (2, 13). As some of these cancers emerge major public health problems in Africa (14), identification of risk factors is important to inform mitigation strategies. Data on early menarche are also important in formulating reproductive health education programs, but are scanty from Eastern African region and Kenya in particular. This study reports characteristics of girls with early menarche.

Materials and methods

The study was done in five primary schools in Nairobi city, Kenya. The schools were identified through a simple random sampling technique. The significance and the method of conducting the study was explained to all the girls in standard four to eight and their class teachers. Only the consenting girls who volunteered to participate with permission of their class teachers were recruited. An open questionnaire was administered to a total of 632 girls from the five schools. It was filled in class while the teachers and investigators waited. The questions covered three main areas:

1. *Residential area:* The girls were asked to state their residence at the time of menarche. During analysis, these residential areas were divided into three namely, low income residences that comprised informal temporary and semi-permanent settlements referred to as slums; middle income residences comprising permanent 2 – 3 bedroom self-contained permanent units in well serviced areas and high income ones consisting mainly of individual homes in the suburbs or well serviced self-contained estates.
2. *Level of income:* The girls were asked to state the occupation and /or profession of the parents or guardians. During analysis these were divided into two; namely, Unskilled casual workers who derived livelihoods from unreliable daily manual work termed as 'Kibarua' or any others who earn government minimum prescribed wages or below; and those in formal employment who were categorized according to government of Kenya job grading system and salary structure.
3. *The effect of menarche on academic performance:* The girls were asked to indicate the effect of menarche on their performance by stating whether their academic performance remained the same, declined or improved consequent to their first menstrual period. The girls also indicated whether or not the change was attributed to the onset of menstruation or other factors. The other factors were interrogated further and only in cases where the guiding and counselling department in the school as well as the investigators

could not objectively identify any other reason was menarche considered to be the key contributing factor. The performance, verified by school records, was considered to have declined where the overall score dropped by more than 25%.

Only 400 (63.3%) of the girls returned the questionnaires for analysis. Ethical approval was granted by Nairobi city council. The lower limit of normal menarcheal age was taken to be 11 years. All those who attained menarche before 11 years were early. Those who had not attained menarche, who could not recall menarche age were excluded. Data were analyzed for frequency and means by SPSS version 17.0 for windows and are presented in tables and a bar chart.

Results

One hundred and thirty eight girls were excluded from the study. Eighty eight could not remember menarche age, 37 had forgotten effect on academic performance and 13 had not attained menarche. These 138 were excluded. Only 262 cases were analyzed. Twenty eight of the 262 girls (10.7%) attained early menarche. Of these 23 (8.8%) were aged 10 – 11 years, while 5 (1.9%) were aged 9 – 10 years. Of the girls who attained early menarche, 10 lived in low socioeconomic residential areas where families lived on less than 1 US dollar a day, whereas 18 lived in higher socioeconomic areas with families earning more than 400 US dollars a month (15 US dollars a day) (Table 1).

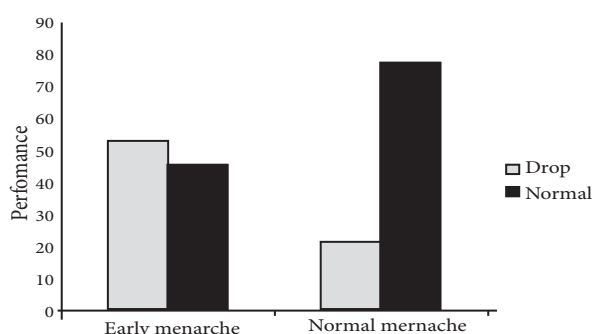
Table 1: Frequency of menarcheal age by residential area

Residential area	Menarcheal age and frequency		
	9 – 10	10 – 11	X ²
Low SES residences	1	9	0.81
Middle and Upper SES residences	4	14	0.67
Total	5	23	

There were fewer girls attaining early menarche among those who lived in low socioeconomic areas than those who lived in middle SES residences. The difference was statistically significant.

Among the 28 girls, 15(53.8%) experienced a decline in academic performance compared to 21.8% of those who attained menarche after 11 years ($p=0.058$). This is illustrated in Figure 1.

Figure 1: Percentage of girls who declined in academic performance



Discussion

Over 10% of the girls attained early menarche. This is substantially higher than 3.6% among European girls who attained early menarche (2) but lower than 28% among African American girls (15). It is comparable to 10.5% in a Nigerian (16) and 10.0% in a Croatian (17) study. Figures from studies on other populations are shown in Table 2.

Table 2: Percent occurrence of early menarche in various populations

Source	Population	Girls that attain early menarche (%)
Al-sahab et al., 2010 (5)	Canadian	13.8
Braithwaite et al., 2009 (18)	Black American	46
	White American	26
Gaudineau et al., 2010 (19)	French	5.3
Mrug et al., 2008 (20)	American	25
Bralic et al., 2012 (17)	Croatian	10
Roman et al., 2003 (21)	New Zealander	20.3
Ofuya et al., 2007 (16)	Nigerian	10.5
Current study	Kenyan	10.2

These figures suggest inter population variation in proportion of early menarche. Indeed studies in America have shown that a higher proportion of black than white girls attain early menarche (15). These variations in the prevalence of early menarche evident even between high income countries with predominantly Caucasian populations, have been attributed to genetic, maternal, environmental/ geographical, lifestyle, dietary, nutritional, occupational and individual phenotypic factors (22). A notable finding of the present study is that nearly 2% of the girls attain menarche by their 10th birth day that is when they are in their 4th grade. This is comparable to that reported in low SES Nigerian population by Ofuya *et al.* (16). These findings suggest that those taking care of these juveniles should be aware of this and that sex education should begin earlier than currently considered.

Early menarche is associated with adverse health effects including eating disorders, depression, diabetes mellitus, metabolic syndrome, obesity, increased cardiovascular risk, elevated blood pressure, incident coronary heart disease, all cause, and cancer mortality after adjusting for other known risk factors (9, 22). The findings of the present study, that over 10% of the studied girls attained menarche, imply that in Kenya, those who attain menarche early should be followed up closely for these health risks.

Girls who attain menarche early are more likely to suffer decline in academic performance. Such a drop is probably due to higher risk of emotional and social problems described among such girls. Early maturing girls have to cope with their own confusing sexual feelings as well as the impact that their maturing appearance has on boys and men. Further, those who develop early menarche are more likely to be depressed, aggressive, socially withdrawn and moody. They are also more likely to be sexually active, have more problems in school (23). This calls for better understanding of these girls by

teachers and parents who should offer more guidance and counseling than reprimand or ridicule. Indeed parental nurturance, communication and knowledge of child's activities reduces the risk of aggressive behavior among early menarche (20).

More girls from middle and upper than those from low SES residences attained early menarche. This is concordant with prevailing reports that girls belonging to a higher SES attain puberty earlier (16, 24-26). Lower menarcheal age among higher SES girls may be attributed to increased fatness of such girls due to better nutrition. A probable mechanism is "critical weight" and leptin (16) or exposure to several chemicals in cosmetics, hair products and food preservatives. These products may be degraded into substances with estrogenic effects that modify female hormonal profile (27). These findings imply that behavior changes occurring earlier in high SES may be attributed to early puberty. Teachers and parents should be aware of this in their provision of sex education, guiding and counseling.

More early menarcheal girls than normal ones suffered decline in academic performance, concordant with literature reports (28). The poor performance has been attributed to discomfort caused by menstruation aggravated by anaemia, malnutrition, emotional and social problems (23, 28, 29). This suggests that teachers and parents of these girls should be more alert in looking out for academic performance of the early menarcheal girls.

Conclusion

Early menarche is a significant problem among urban primary school girls in Kenya; especially those from higher income backgrounds and constitutes part of the causes of decline in academic performance. Further studies to identify the possible causes and mitigations including structured early reproductive health education as well as follow up of the victims for potential adverse health effects are recommended.

The study had its limitations as it was conducted on a small number of girls in an urban setting and hence results may not be generalized to reflect the state in the Kenyan population.

Acknowledgements

We are grateful to the teachers and pupils of Langata West, Karen C, Uhuru gardens, Ngei and Olympic Primary schools in Langata Division, Nairobi West Province in Kenya for their cooperation and assistance with data collection

Conflict of Interest: None. There was no external funding for this study.

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