Decline in menarcheal age among Saudi girls

Ibrahim A. Al Alwan, MD, Areej A. Ibrahim, MD, Motasim A. Badri, PhD, Mohammed S. Al Dubayee, MD, Bassam S. Bin-Abbas, MD.

ABSTRACT

Objectives: To estimate age at menarche and to assess trends in menarcheal age among Saudi women.

Methods: A prospective longitudinal study was conducted among healthy prepubertal female school children and adolescents from September 2006 to July 2012 in Riyadh, Kingdom of Saudi Arabia. Study participants were invited from diverse socioeconomic backgrounds. Tanner stage, height, weight, body mass index, and socioeconomic parameters including parent's level of education were collected. Age at menarche was compared with maternal age at menarche.

Results: The study included 265 girls and mothers. Mean ± standard deviation (SD) age at menarche for girls was 13.08 ± 1.1 years, and their distribution category across the ≥10 years was 4 (1.5%), 11-14 years was 239 (90.2%), and ≤15 years was 22 (8.3%). A downward secular trend in age of menarche was observed (Cuzick test for trend = 0.049). Girls attained menarche at younger age compared with their mothers (p < 0.0001). A downward secular trend in menarcheal age was observed.

Conclusion: Saudi girls attain menarcheal age earlier than their mothers, reflecting a downward secular trend in menarcheal age.

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Menarcheal age in Saudi girls: A follow-up study of a prospective cohort study

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Methods. Study design. Participants. girls were included in the Study design. A total of 265 girls were included in the study. The age at menarche was recorded as the age at the time the present study was conducted; and were therefore recruited into this study. Four girls were excluded as their mothers could not recall the time of menarche in these girls with the age at menarche of their mothers.

Parent's education. The job of both parents was recorded in the questionnaire, categorized into 6 categories: governmental, nongovernmental, business, retired, unemployed, and others. The educational level of both parents was recorded and categorized into 7 categories including: primary school, intermediate school, high school, university, higher education, and unknown.

Statistical analysis. Cuzick test for trend was used to compare age at menarche. All tests were 2-sided and considered significant. The Statistical Package for Social Sciences version 20 (IBM Corp., Chicago, IL, USA) was used to analyze data. A logistic regression analysis was conducted to identify variables (all categorical or continuous data) associated with age at menarche. A two-tailed Fisher exact test was used to compare categorical proportions or medians (interquartile range).

Results. Thirty percent of Saudi girls in the central part of KSA attained menarche at the age of 10 years or less. The mean age at menarche was 15.1 years for girls at the western part of Saudi Arabia, and 14.8 years for girls at the eastern part. No data exists as it marks transition from childhood into adulthood with all known biological and psychological characteristics among school girls in Riyadh, KSA. Factors affecting menarche age in these girls with the age at menarche of their mothers.

Growth parameters. The status of this trend among Saudi girls is not known. In 1995, mean age at menarche was found to be 15.1 years for girls at the western part of Saudi Arabia, and 14.8 years for girls at the eastern part. This trend might have slowed, or even stopped in some European countries, although it is still ongoing in Asia and the Middle East.

Parent's work. The job of both parents was recorded in the questionnaire, categorized into 6 categories: governmental, nongovernmental, business, retired, unemployed, and others. The educational level of both parents was recorded and categorized into 7 categories including: primary school, intermediate school, high school, university, higher education, and unknown.

Parent's income. Family income was recorded as the amount of money earned by the family per month, including child's allowance, and categorize into 7 categories from less than 3000 to more than 20,000 Riyals. Two more categories were added to include those who did not report their income.

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Menarcheal age in Saudi girls was 13.08 years; 1.5% had early menarche (<10 years), and 8.3% had late menarche (≤15 years). None of the socio-demographic and anthropometric characteristics of the girls or their mothers were significantly associated with age at menarche. Mean ± SD age at menarche for mothers was 13.67 ± 1.4 years, and their distribution category across the ≥10 years was 7 (2.6%), 11-14 years was 172 (64.9%), and ≤15 years was 86 (32.5%). Mean age at menarche for mothers and girls was statistically different (t-test p < 0.0001). In addition, the trend across the 3 categories of age at menarche for girls was also statistically significantly different from their mothers' age at menarche (Cuzick test for trend = 0.049).

Discussion.

This study is among the studies carried out to estimate age at menarche for Saudi girls in Riyadh, KSA and to explore its association with growth parameters, mother's income, and level of education, and to compare age at menarche for girls with that of their mothers. The mean age at menarche for girls in our study was estimated at 13.08 years; 1.5% had early menarche (<10 years), and 8.3% had late menarche (≤15 years). No statistically significant variations were found between menarcheal age groups across growth parameters, mother income and mother level of education.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Girls age at menarche in years</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤10</td>
<td>11-14</td>
</tr>
<tr>
<td>Number (%) of girls</td>
<td>4 (1.5)</td>
<td>239 (90.2)</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>159 (153-162)</td>
<td>157 (152.5-161)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>51 (40.5-67.5)</td>
<td>52 (47-60.3)</td>
</tr>
<tr>
<td>BMI (%)</td>
<td>20.4 (16.3-26.7)</td>
<td>20.8 (19.3-24.2)</td>
</tr>
<tr>
<td>Mother's education level</td>
<td>0.098</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Primary</td>
</tr>
<tr>
<td>Family income level†</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

*p - value: χ2 (or Fisher exact) test for categorical data and Kruskal-Wallis test for continuous data.

Table 1 - Characteristics of 265 girls and mothers by age at menarche in Riyadh, Kingdom of Saudi Arabia.

Figure 1 - A comparison of age at menarche for 265 girls and their mothers in Riyadh, Kingdom of Saudi Arabia.
Menarcheal age in Saudi girls: comparison with age at menarche regionally and internationally

The study by Al Alwan et al. suggests that menarcheal age in Saudi girls is lower compared to that in other countries, with a statistically significant difference. This finding is consistent with international trends, where girls from higher socio-demographic areas tend to have lower menarcheal age, possibly due to improved nutrition status and lower stress levels. Conversely, girls from lower socio-demographic areas in Saudi Arabia were found to have earlier menarche, which may be attributed to delayed menarcheal age in these regions.

In a cancer study conducted in Jeddah in 1995, the age at menarche was found to be 15.1 years, which is lower than the reported age of 13.22 years in Nigeria, 12.72 years in Egypt, and 12.44 years in Canada. This shows a pattern of aging younger in Saudi Arabia compared to other countries.

Delayed menarche is associated with lower age at menarche, which may lead to increased deposition of fat in the peripheral adipose tissue. Factors such as BMI, growth parameters, social class, and country of birth can affect menarcheal age. In this study, no significant effect of social class was observed, and a similar result was found among Canadian girls.

It is important to note that the findings of this study should be considered in the context of demographic and socioeconomic variations. Further studies are needed to determine the effect of socio-demographic factors on menarcheal age at other parts of the Kingdom. The age at menarche is an important indicator of pubertal development and its implications on health outcomes.

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