Decline in menarcheal age among Saudi girls

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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%). 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%). Girls attained menarche at younger age compared with their mothers (p<0.0001). A downward secular trend in age of menarche was observed (Cuzick test for trend = 0.049).

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

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Disclosure. A cc c f ee, a d e ad f d ed b a d c a . d a f d ed b e K Abd a I e a a Med c a Re e a C e, R a d, K d f Sa d A b a. 
The family income was recorded as.

Data were summarized as.

Data were collected by female.

The level of education for.

Declaration.

was performed according to the principles of Helsinki.

KSA, and informed consent was obtained. The study.

Committee at King Abdulaziz Medical City, Riyadh,

protocol was approved by the Research and Ethics

menarche were excluded from the study. The study's.

Planning and the Ministry of Education to construct

high, as well as low social class from the 4 regions of

therefore recruited into this study. Four girls were

excluded as their mothers could not recall the time of

at menarche in these girls with the age at menarche of

This trend

Menarche age.

Parent's education.

Parent's work.

Family income.

Menarcheal age in Saudi girls  ...

statistical analysis.

Methods.

Study design.

Results.

Menarche age was recorded as.

Table 1
Menarcheal age in Saudi girls

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

<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></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>33 (13.8)</td>
</tr>
<tr>
<td>Primary</td>
<td>2 (50)</td>
<td>83 (34.7)</td>
</tr>
<tr>
<td>Secondary-high</td>
<td>1 (25)</td>
<td>72 (30.1)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>1 (25)</td>
<td>51 (21.3)</td>
</tr>
<tr>
<td>Family income level†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>0</td>
<td>17 (7.1)</td>
</tr>
<tr>
<td>High</td>
<td>4 (100)</td>
<td>222 (92.9)</td>
</tr>
</tbody>
</table>

*P-value: \( \chi^2 \) (Fisher exact) test for categorical data and Kruskal-Wallis test for continuous data.

†Mother's income level: low income <3000 Riyals per month. BMI - body mass index.
Menarcheal age in Saudi girls 20 years ago was compared in a population-based study from Jeddah in 1995, which was found to be 15.1 years compared with 15.26 years in Nigeria, 15.23 years in Canada, 16.9 years in UK, 15.7 years in Egypt, 15.8 years in Argentina, 15 years in Japan, 15.1 years in Norway, 14 years in US, 14 years in China, 13.2 years in UK, 12.6 years in Egypt, 12.4 years in Japan, and 12.3 years in Canada. The mean menarcheal age in most of the previously reported studies is 14 years. 

A similar decline in age at menarche was demonstrated in previously reported studies at both national and international levels. Boys and girls from higher socio-demographic areas were found to have earlier menarche. This has maybe been explained by improved nutrition status during early menarche leads to increased deposition of fat in the peripheral adipose tissue. The effect of socio-demographic factors has been well demonstrated in previously reported studies at both national and international levels. 

As a result of hyperinsulinemia, insulin resistance, and increased BMI, obesity has an inverse relationship with age at menarche. The exact mechanism of this relationship is not yet clear, but possible explanations may be that increased BMI during prepubertal period increases the availability of estrogen, promotes breast development, and decreases the risk of breast cancer. 

The fat in the peripheral adipose tissue and lower stress levels among girls from higher socio-demographic areas leading to delayed menarcheal age. This may be explained by improved nutrition status and lower stress levels among girls from higher socio-demographic areas. 

Stress and obesity are also considered factors that lead to earlier menarche. Al-Sahab and colleagues found that girls from higher socio-demographic classes had significantly earlier menarche compared with girls from lower socio-demographic classes. 

In our study, no significant effect of social class on age at menarche was observed; from 12.7 years in 2000 to 12.4 years in 2015. This might suggest an ongoing secular trend of declining menarcheal age among Saudi girls. In conclusion, age at menarche among Saudi girls in Riyadh is comparable to age at menarche regionally and internationally with a secular trend toward a declining age at menarche for girls in our study is compared with that of girls in other countries. 

The estimated age at menarche for Saudi girls in 2000 was 15.5 years compared with 12.5 years in Egypt, 12.6 years in Ethiopia, 12.5 years in Argentina, 12.3 years in Canada, and 12.8 years in Nigeria. This trend might have slowed, or even stopped in some European countries. 

We acknowledge the limitations of this study. The recall bias, and hence represents an estimate rather than an accurate age at menarche. However, the age at menarche recorded in our study might have been subjected to bias and error. 

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