

## Age at menarche and the reproductive performance of Saudi women

Zainab A. Babay, ABOG; Mohammed H. Addar, ABOG; Khalida Shahid, MRCOG; Naema Meriki, ABOG;

**Background:** Saudi Arabia has undergone substantial development in the recent past with concomitant changes in living conditions, and economic and general health status that have affected the age at menarche in Saudi women. We evaluated the current age at menarche and reproductive events among Saudi women.

**Subjects and Methods:** Age, age at menarche, age at marriage, age of first pregnancy, number of children, and number of abortions were collected for Saudi women attending King Khalid University Hospital (KKUH) over a 3-month period in 2002.

**Results:** For 989 Saudi women, the mean age at menarche was 13.05 years. There was a decrease in the age of menarche over the past 20 years, an increase in the age of marriage, age of first pregnancy, and a decrease in the number of children and abortions. Compared with data from two decades, the age at menarche decreased significantly from 13.22 to 13.05 years.

**Conclusion:** The decrease in the age of menarche among Saudi women indicates better socioeconomic status and improvements in health.

**Key words:** Menarche, marriage, pregnancy, abortion, Saudi Arabia

*From the Ob/ Gyn Department,  
King Khaled University Hospital,  
Riyadh, Saudi Arabia.*

*Correspondence to:*

*Dr. Zainab Babay*

*Ob/ Gyn Dept.*

*P.O.Box 7805*

*King Khaled University Hospital*

*Riyadh 11472, Saudi Arabia.*

*E mail: zbabay@hotmail.com*

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Age at menarche—the appearance of first menstruation—a stage in female maturation, is an indicator of female physiological development, health and nutritional status.<sup>1</sup> Several studies have reported that the age of menarche may relate to subsequent reproductive performance, such as the age of first intercourse, age of first pregnancy, and risk of subsequent miscarriage and pregnancy.<sup>2-4</sup> There is also a strong evidence of a downward secular trend for the age of menarche in Western countries during the nineteenth century.<sup>1</sup> Saudi Arabia has undergone substantial development in the recent past with concomitant changes in living conditions, and economic and general health status. This study was conducted to evaluate the menarcheal age among Saudi women and their reproductive events subsequent to these changes in Saudi society.

### Subjects and Methods

The study was carried out at King Khalid University Hospital (KKUH) in the year 2002 by interviewing all Saudi females in the waiting area every morning for three months. Data collected included age, age of menarche, age at marriage, and parity, including number of live births and abortions and the age of first pregnancy. Statistical analysis was done using SPSS version 10. In addition to a descriptive analysis, the Pearson correlation coefficient was used to test correlation between variables. A *P* value of 0.05 was considered statistically significant. An additional analysis was carried out to compare between the means of age at menarche, age of marriage, age of first pregnancy and number of children between

our results and the results reported by Jabbar et al in 1988<sup>5</sup> on the reproductive performance of Saudi women.

**Table 1.** The distribution of age at menarche, age of marriage, and age of first pregnancy among 989 Saudi women.

Age (years)	Number	%
Age of menarche		
11	86	8.7
12	233	23.6
13	345	34.9
14	182	18.4
15	140	14.1
Age of first pregnancy		
< 15	13	1.3
15 -19	309	31.3
20 - 24	338	43.3
25 - 34	152	15.2
> 34	12	1.2
Age of marriage		
<15	59	5.9
15 - 19	423	42.8
20 -24	362	36.6
25 -34	106	10.6
> 34	4	0.4

**Table 2.** Frequency of number of children and abortions among the Saudi women.

	Number	Frequency	%
Number of children	0	280	28.3
	1 - 3	345	34.9
	4 - 5	149	15.1
	6 - 10	166	16.7
	> 10	16	1.6
Number of abortions	0	626	63.3
	1- 3	297	30.0
	> 3	32	3.2

### Results

The 989 Saudi females we interviewed had an average age of  $30.05 \pm 8.87$  years (range, 12-70 years). Only 3 (3.2 %) were unmarried at the time of the interview. There were 3 cases of primary amenorrhea (0.3%).

The mean age at menarche was  $13.05 \pm 1.32$  years (range, 9-18 years), mean age of marriage was  $19.9 \pm 4.0$  years (range 9-40 years), mean age of first pregnancy was  $21.28 \pm 4.11$  years (range, 14-43 years), mean number of live births was  $2.83 \pm 2.99$  (range, 0-20), and mean number of abortions was  $0.64 \pm 1.15$  (range, 0-9). The distributions for age at menarche, age of first pregnancy and age of marriage are shown in Table 1. Table 2 shows the frequency of number of children and abortions among Saudi women.

Table 3 shows the Pearson correlation coefficient between variables. There was a significant correlation between the age and the age at menarche, number of live births and number of abortions. The age at menarche had a statistically significant correlation with the age of marriage, but no significant correlation with age of first pregnancy, number of live births or number of abortions. The age of first marriage significantly correlated with the age of first pregnancy, and had a significant negative correlation with the number of live births and number of abortions. The age of first pregnancy had a significant negative

correlation with the number of live births and number of abortions.

The results of the comparison with the data reported by Jabbar et al in 1988 are shown in Table 4. The age at menarche was significantly less in our study (13.05 compared with 13.22), the age of marriage was significantly higher in our study (19.90 compared with 18.22), the age of first pregnancy was significantly higher in our study (21.28 compared with 18.32), and the number of children was significantly less (2.83 compared with 4.53).

### Discussion

Nutritional status is related to age of menarche and is especially linked to increases in body weight. More generally, better nutritional status is associated with lower age at menarche.<sup>6</sup> This relationship is widely believed to explain the secular decline in age at menarche in developed countries. In addition, improvement in nutritional status is widely associated with improvement in socio-economic factors, which affect age at marriage directly, as well as through a potential nutrition-menarche link. Our study shows a significant decline in the age of menarche among Saudi women over the past 20 years (13.05 years now compared to 13.22 years of age 20 years ago) and this is within the expected range as a decline of about 4 months per decade is expected.<sup>7</sup> However, the age at menarche in Saudi Arabia is still greater than in the North American countries and most European countries,<sup>8,9</sup> but is comparable to that found in most Asian studies.<sup>10</sup> This may reflect genetic factors in addition to environmental factors.

The mean age of marriage in our study was also comparable to other studies in the world with the only difference a slightly higher percentage of marriage under the age of 15 years (5.9%). The significant increase in the age of marriage among Saudi women noted over the past 20 years was also expected as continued improvement in socioeconomic status has been coupled with marked changes in women's status and roles, most notably a shift from the traditional role within the household to participation in the formal labor market. These factors, in addition to better education in contraceptive methods, have contributed to the

**Table 3.** Pearson correlation coefficient between variables.

Variable	Age	Age at menarche	Age of marriage	Age of first pregnancy
Age at menarche	0.097*			
Age of marriage	-0.057	0.67*		
Age of first pregnancy	0.013	0.52	0.920*	
Number of live births	0.745*	0.019	-0.395*	-0.362*
Number of abortions	0.294*	0.016	-0.138*	-0.113*

\* $P < 0.05$



**Table 4.** Comparison between mean age at menarche and other reproductive variables at present and 20 years ago among Saudi women.

Variable	Mean (20 years ago)	Mean (present)	P value	95% C.L
Age at menarche	13.22	13.05	0.000	12.88 – 13.22
Age of marriage	18.22	19.90	0.000	0.873 – 256.00
Age of first pregnancy	18.32	21.28	0.000	0.129 – 327.29
Number of live births	4.53	2.83	0.000	1.43 – 1.97

observed rising age of marriage and declining number of children.

The most interesting finding in our study is that there was no significant relation between age at menarche and subsequent family formation (age of first pregnancy and number of children), despite the significant association between age of menarche and the age of marriage. This may be explained by the fact that in the Saudi society, sexual activity is prohibited prior to marriage and early marriage used to be favored, but on the other hand, early marriage among women of young age at menarche is partially offset by the longer first birth interval. In addition, the decrease

in the age of menarche was not associated with an increase in the number of abortions even though the percentage of teen age pregnancy was 32.6% (Table 1). This may be explained by the fact that adolescent pregnancies in Saudi Arabia are not affected by adverse socio-cultural variables as in Western countries such as a single parent family and lack of parental control.

In conclusion, we found a reliable decline in menarcheal age in Saudi Arabia in the last decade. In addition to the increase in the age of marriage and age of first pregnancy, all indicate better nutritional, health and socioeconomic status.

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