

MENARCHEAL AGE OF SCHOOL GIRLS AT HOLY MAKKAH DISTRICT

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ABSTRACT

This was a cross-sectional anthropometric study carried out among female students at intermediate and secondary schools at Makkah Al-Mukarramah district. The main aim of this study was to determine the age of onset of menarche among these students and the relation of menarcheal age to anthropometric measurements represented by weight, height, and body mass index. The study revolving around 200 female students within the age range of 12 to 16 years. The study procedure consisted of collecting the data by way of anthropometric parameters and interview questionnaire. In this study the mean age at menarche was found to be 12.1 ± 1.1 year. The study revealed that menarche occurred at an earlier age in comparison to the last three decades worldwide. This is actually consistent with similar studies done recently. This earlier menarcheal age among the participants in our study may be justified by improvement in living conditions and prosperity of socio-economic status at Makkah AL-Mukarramah district.

KEYWORDS: Anthropometric, Female Menarcheal, Body Mass Index

INTRODUCTION

Menarche, the first menstrual cycle ever experienced by the female, is an important transition event in the female life cycle. It represents a concrete shift from a girl to a woman [1]. Unlike other gradual pubertal changes, such as breast development and pubic hair growth, menarche usually occurs suddenly and without precise anticipation. Menarche occurs earlier than it once did in many parts of the world especially in Europe and America [2]. In these regions it declines at a rate of approximately four months per decade till it stabilized at around 13 years [3]. This was attributed to better socioeconomic status and improved health and nutrition. As the industrialization and hence the wealth is concentrated more in urban areas than the rural ones, its impact on the girls residing in urban areas is likely to be prompt.

Almost all industrialized countries do not show any statistically significant differences in mean age at menarche for different social classes. On the other hand, large differences among social classes have been reported from the third world countries, where the gap between rich and poor is very much great. Various factors have been postulated to affect the age at menarche like socioeconomic status, diet, exercise, environment, sibship, genetic and hereditary factors, ethnicity, body mass, level of education, migration, and chronic illnesses [4]. Although some women recall feeling more mature, grown up, proud and excited; others report having various negative experiences, such as being scared, worried, anxious, moody, and embarrassed with the onset of menstruation [5, 6].

In the female, as in the male, the infantile pituitary gland and the ovaries are capable of full function if appropriately stimulated. However as is also true in the male, and for reasons not understood, the hypothalamus does not secrete significant quantities of GnRH during childhood.

Experiments have shown that hypothalamus is capable of secreting this hormone, but the appropriate signal from some other areas of brain to cause the secretion is lacking. Therefore, it is now believed that the onset of puberty is initiated by some maturation process that occurs elsewhere in the brain, perhaps somewhere in the limbic system [7]. There is another theory claiming that the hypothalamus has high sensitivity to low concentration of estrogen and progesterone during childhood with subsequent inhibition of GnRH (negative feedback mechanism). With onset of puberty, the sensitivity of hypothalamus to estrogen and progesterone is decreased. Thus, the hypothalamus releases GnRH in high pulsating manner which stimulates the anterior pituitary gland to produce follicle stimulating hormone (FSH) and luteinizing hormone(LH) hormones,(FSH and LH) [8]. Exogenous GnRH pulses causes the onset of puberty [9].

Between menarche and menopause (last menstrual bleeding), the female reproductive system undergoes cyclic changes called the menstrual cycle. This includes maturation and release of oocytes from the ovary during ovulation and periodic vaginal bleeding resulting from shedding of the endometrial lining. It is not necessary for the woman to ovulate to menstruate; anovulatory cycles do occur. The menstrual cycle produces changes in the breasts, uterus, skin, ovaries, and perhaps other unidentified tissues.

The maintenance of the cycle affects the biologic and sociologic aspects of woman's life, including femininity, sexuality, fertility, and reproduction [10]. Normal menstrual function results from interactions among the hypothalamo-hypophysial-ovarian axis and associated target tissues. In most women in the middle reproductive years, menstrual bleeding occurs every 25 to 35 days, with a median length of 28 days [11].

People tend to confuse the terms adolescence and puberty, and use them synonymously. However, puberty refers to the physiological changes involved in the sexual maturation of a child (the child becomes capable of reproduction), as well as other body changes that may occur during this period of time. Adolescence refers to the transitional stage of development between childhood and adulthood [12]. Sexual and physical maturation will induce large degree of psychological growth during this period of time. Adolescence is described as being the teenage years of age; however, puberty decides the onset of adolescence. Adolescence largely overlaps the period of puberty, but its boundaries are less precisely defined [10,13].

Female secondary sexual characteristics are physical and behavioral features that signal the presence of sexual maturity, but are not directly part of reproductive system. This is in contrast to primary sexual characteristics which are the sex organs which are directly necessary for reproduction to occur (ovaries and testicles). Sequential pattern of female adolescent's growth goes as follows: beginning of growth spurt; budding stage of breast development; appearance of non-pigmented pubic hair; beginning of rounding of the hip, and beginning of appearance of downy axillary hair; uterus, vagina, labia, and clitoris increase in size; pubic hair growth becomes rapid and is slightly pigmented; breast development advances, nipple pigmentation begins, and the areola increases in size, and axillary hair becomes slightly pigmented; growth spurt reaches its peak; onset of menarche; pubic hair development is completed followed by mature breast development and completion of axillary hair development; the girl is now capable of conception [14,15].

Studies on menarche have been typically focused on white American middle-class sample with little attention to other cultural groups. People are usually unaware of factors contributing to menarcheal age. The impact of menarche on several legislative commitments is very obvious. This study aims to predict the age at menarche among Saudi school's girls at holly Makkah district.

SUBJECTS AND METHODS

This is Descriptive cross - sectional school - based study. The study was conducted at holy Makkah district from 3/1432 to 4/1432 H. The subjects of the study are female students, at age from 12 to 16 in intermediate and secondary school at holy Makkah city. The study revolving around 200 participants. The school authority was informed and asked for permission. An informed consent was given by the school headmistress. All participants were informed about the procedures and aims of the study. Any one who was reluctant to participate in this study was excluded.

The age of menarche for each participant is determined by status que method; the subject is asked about her “current status”, i.e., whether she had had her first menses by the time of assessment or not. Based on her birth date the menarcheal age is determined [16]. The girls were weighed on an equilibrate digital balance scale (camry) which was set to zero before each weighing to ensure accuracy. The weight was taken without shoes while wearing very light clothes. Weight was read to the nearest 100 grams [17] (Ann Hum Biol, 1998).

The stature standing height measured as the distance from the sole of the feet to the top of the head. It is measured without shoes using a tape fixed to the wall. The subject stands erect, so that the line of the sight in horizontal and the heel and subscapulae are align with the wall. The distance from the sole of the feet to the top of the head was measured and recorded to the nearest 0.1 cm. Body mass index was calculated as body weight in Kg divided by height in square meter.

The statistical package for social sciences (SPSS) version 15 was used to analyze the results. Descriptive statistics were used to describe the characteristics of the study population. Data were represented as mean \pm standard deviation.

RESULTS

The total number of girls participated in this study is 200. The mean age at menarche for the entire sample studied is 12.6 ± 1.1 years. The earliest age of menarche reported was subjects reported that they attained menarche before completing The latest onset of menarche recorded in this study is 16 years (Table 1)

A.O.M

Table 1: Frequency Table for Age at Menarche

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 10.00	6	3.0	3.0	3.0
11.00	19	9.5	9.5	9.5
12.00	71	35.5	35.5	35.5
13.00	68	34.5	34.5	34.5
14.00	26	13.0	13.0	13.0
15.00	8	4.0	4.0	4.0
16.00	2	1.0	1.0	1.0
Total	200	100.0	100.0	100.0

Statistics

Table 2: Body Mass Index in Relation to Age of Menarche (A.O.M.)

	Weight	Height	BMI	A.O.M
N Valid	200	200	200	200
Missing	0	0	0	0
Mean	54.1200	161.0000	24.4195	12.6050

Table 2: Contd.,

Median	51.0000	155.0000	21.4500	13.0000
Mode	50.00	154.00	22.20	12.00
Std. Deviation	13.85480	70.71778	23.20621	1.11137
Variance	191.955	5001.005	538.528	1.235

DISCUSSIONS

The land marks of pubertal events in girls are the onset of puberty, peak height velocity and menarche. The onset of puberty is marked by the development of breast tissue, while peak height velocity is the highest velocity that is observed during the pubertal growth spurt. Menarche is a milestone in a women's life as it denotes the start of reproductive capacity. The age of menarche varies in different parts of the world and is dependent on the interaction between genetic and environmental factors. The mean age at menarche in this study is (12.6±1.1years). This is consistent with the strong evidence of a downward secular trend in age at menarche in Europe and USA during the last century, and in Japan and china during the past few decades [17]. It is also lower than African mean menarcheal age that reported [18]. The reduction in mean menarcheal age in this study may be attributed to the improvement in living conditions and socioeconomic status in holy Makkah district.

Among our 12 to 16 year Saudi girls in holy Makkah district. The average weight, height and BMI were found to be 54 kg and 161 cm, BMI respectively (Table 2). Several studies have proven that girls with higher body mass index reach their menarche earlier [19, 20, 21]. However, A Publication of the USDA Center for Nutrition Policy and Promotion March 2000, this study revealed that, variations in BMI within the normal range of 18.5-24 [22] are not consistent with the age attained at menarche. Seems that childhood obesity may influence the menarche age However, whether food intake or cretin nutritional elements play a role or other hormonal factors affect menarche remain to be settled.

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