

# Bio-Social Factors Affecting Age of Attainment of Menarche-A Study From Semi-Urban City of Karnataka



## Medical Science

**KEYWORDS :** Adolescent girls ,BMI, Menarche, Socio-economic status.

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### ABSTRACT

*Background: Adolescents form about 20 to 30% of our population. Menarche is viewed as an excellent excellent physiological marker of maturation in girls.The present study was undertaken to correlate between age of menarche and bio-social factors affecting it.*

*Materials and Methods:This is a Cross- sectional study.This study was conducted among 500 adolescent girls in the age group of 10 to 17years, randomly selected from urban and rural schools of city of Davangere. Girls age was taken from school records, weight ,height was recorded,exact date of attainment of menarche was recorded,thorough examination was done to rule out any systemic illnesses,their socio-economic status was assessed with their parental help.*

*RESULTS:60% of the girls of age group 14 and 15 years.12.9 years was the mean age of attainment of menarche. Of the 5 girls who had attained menarche at 10 years of age, majority of them belonged to social class I and II, on the contrary girl who attained late menarche that is at 16 years belonged to social class IV. In our study the relationship between social class and age at menarche was highly significant  $P<0.05$ (HS).Correlation between age of menarche and BMI was not statistically significant in our study.*

*CONCLUSION: Low socioeconomic status have an impact on age of attainment of menarche, BMI didn't have much affect on age of attainment of menarche.*

The term adolescence comes from latin word adolescere which means to grow up<sup>(1)</sup>.

Adolescence is divided into early(10-13), middle(14-16) and the late adolescence(17-20).During this period, the changes occur in pattern of thinking, attitude, ideas relationship and moral standards and this transition is uneven reaching an earlier physical maturity and reproductive capability, than psychological and social maturity<sup>(2)</sup>.

Although, comprising only one decade of life span (10-19), it is a prelude to the ultimate life the individual will be destined to live. Thus this period of life requires special attention from the family, community and society as whole<sup>(3)</sup>.

### METHODS:

This study was done on adolescent girls of Davangere city.

There are 62 high schools in the city (both urban and rural), where adolescent girls are studying, 10% of the schools that is 6 schools were selected via simple random procedure with the help of computer generated tables. This is a cross- sectional observational study. Study was conducted during the period of Jan 2008 to Jan 2010.

500 adolescent girls in the age group of 10-17 years was examined thoroughly to rule out any systemic diseases,their weight, height, exact date of attainment of menarche, was recorded the girls were interviewed privately and other aspects like socio-economic status, parents income and other details was collected in a pre-designed proforma which was taken home and filled with parental assistance. Oral consent was taken from the girls before conducting the study.

The girls were grouped according to Modified kuppuswamy scale in urban girls and pareekh scale in rural girls for socio-economic status. BMI was calculated using weight and height parameters.

**INCLUSION CRITERIA :** Adolescent girls 10-17 years, girls less than 10 and more than 17 years, girls with chronic illnesses were

excluded from the study. Age was taken from the school records.

### RESULTS:

To know the relationship between socio-economic status and age at menarche the study group was categorized according to various socio-economic status and correlated with corresponding age of menarche.

60% of the girls were in the age group 14 and 15 years as shown in table 1. 36%of the girls belonged to the socio-economic class1, 12.9years was the mean age of attainment of age of menarche. The above analysis showed that there is statistically significant inverse relationship between age at menarche and socio-economic status. As the socio-economic status increases the age of menarche decreases. Majority of the girls who attained the menarche at 10 and 11 years belonged to socio-economic class 1 and 2. Girl who attained late menarche i.e at 16 years belonged to socio-economic classV. The co-relation is shown in table 2( $p<0.005$ ,which is highly significant).This is consistent with other studies by Bai and Vijayalakshmi<sup>(4)</sup> and a study done in punjab<sup>(5)</sup>.

Co-relation between BMI and age of attainment was not statistically significant ( $p>0.05$ )in our study,as shown in table 3.This was not consistent with a study done by on adolescent girls in lucknow<sup>(6)</sup>.

**Table 1: DISTRIBUTION OF ADOLESCENT GIRLS ACCORDING TO THE AGE(Yrs)**

Age	Number	Percent
10	29	5.8
11	38	7.6
12	23	4.6
13	86	17.2
14	185	37.0
15	119	23.8
16	18	3.6
17	2	0.4
Total	500	100

**TABLE-2: CORRELATION BETWEEN AGE AT MENARCHE AND SOCIAL CLASS**

Age in Years	SOCIAL CLASS					TOTAL
	I	II	III	IV	V	
10	2(1.6%)	2(1.7%)	1(1.9%)	0(0.0%)	0(0.0%)	5(1.5%)
11	8(6.3%)	4(3.4%)	2(3.7%)	1(3.0%)	0(0.0%)	15(4.4%)

12	37(29.4%)	32(26.9%)	14(25.9%)	4(12.1%)	5(45.5%)	92(26.8%)
13	65(51.6%)	52(43.7%)	22(40.7%)	14(42.4%)	2(18.2%)	155(45.2%)
14	12(9.5%)	26(21.8%)	13(24.1%)	11(33.3%)	3(27.3%)	65(19.0%)
15	2(1.6%)	3(2.5%)	2(3.7%)	3(9.1%)	0(0.0%)	10(2.9%)
16	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	1(9.1%)	1(0.3%)
Total	126	119	54	33	11	343
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**CHI SQUARE TEST**

	Value	df	Asymp.Sig.(2-sided)
Pearson Chi-Square	57.449(a)	24	.000
Likelihood rRaRatioRRatio	35.512	24	.061

**P < 0.005 highly significant**

**TABLE 3: CORRELATION BETWEEN AGE AT MENARCHE AND BODY MASS INDEX**

Age in years	BMI				Total
	Normal	Obesity	Overweight	Underweight	
10	4(1.6%)	0(0.0%)	0(0.0%)	1(1.6%)	5(1.5%)
11	11(4.3%)	1(10.0%)	1(5.9%)	2(3.2%)	15(4.4%)
12	64(25.3%)	3(30.0%)	3(17.6%)	22(34.9%)	92(26.8%)
13	121(47.8%)	5(50.0%)	7(41.2%)	22(34.9%)	155(45.2%)
14	45(17.8%)	1(10.0%)	(29.4%)	14(22.2%)	65(19.0%)
15	8(3.2%)	0(.0%)	1(5.9%)	1(1.6%)	10(2.9%)
16	0(.0%)	0(.0%)	0(.0%)	1(1.6%)	1(0.3%)
Total	253	10	17	63	343
	100.0%	100.0%	100.0%	100.0%	100.0%

**CHI SQUARE TEST**

	Value	df	Asymp.Sig.(2-sided)
Pearson Chi-Square	13.374(a)	18	0.769
Likelihood Ratio	12.769	18	0.805

**P > 0.05 NS Correlation between age and BMI was not statistically significant in our study.**

**DISCUSSION:**

In our study the relationship between social class and age of menarche was significant P<0.005 (HS).As the socio-economic status increases, the age of menarche decreases. Of the 5 girls who attained menarche at 10yrs of age, majority of them belonged to socio class 1 and 2. On the contrary girl who attained late menarche i.e at 16 yrs belonged to social class 4 . These results correlate well with the study done by Deo DS on adolescent girls of Sholapur.

In our study majority of girls who attained menarche by 13years had normal BMI, underweight is usually associated with delay in age of menarche, it was not statistically significant in our study because girls with less BMI, were less in comparison with girls with normal BMI. There was a strong inverse relationship between BMI and age at menarche in PCOS,in a study done in Boston<sup>(7)</sup>.

Numerous factors act in combination, including genetic influences, socio-economic conditions, general health and well being, nutritional status and some types of exercise,determine the age of menarche.The importance of genetic factors is illustrated by the similar age of menarche in members of an ethnic popula-

tion and in mother-daughter pairs. It is found that as the menarchal ages of mother increased , the mean menarchal age of daughters also increased correspondingly<sup>(9)</sup>.

The mean age at menarche in our study was 12.9(+or-) 0.94 yrs.The lowest age of attainment of menarche was 10 yrs and the highest being 16 yrs, which is almost similar to study done on girls of Sholapur<sup>(9)</sup>.

There has been a secular trend to earlier menarche over the past century, with a decrease of about 3-4 months per decade. Thus the average of menarche in 1840 was 16.5 and is presently 12.8 yrs. One interpretation of this is, that it reflects improvement in health and environmental conditions. It is interesting that on one hand the menarche has been occurring earlier and the other hand the menopause has been shifting to a later period in woman's life<sup>(9)</sup>. Merzenish et al 1993<sup>(10)</sup>,noted that the increased sport activity is associated with delay in age at menarche. It may be the vigorous exercise, intense physical and mental stress which delays the menarche. At the same time it is thought that the stress involved with strenuous exercise could inhibit or alter GnRH pulse generator<sup>(11)</sup>.

The diet having high contents of calories and rich in proteins causes better physical maturation and early menarche<sup>(10)</sup>.

The knowledge of age of menarche in a given population is a pressing need of the society as no law about the age of marriage, age of consensual sex, abortion, family planning, rape and other aspects of female reproductive life can be made without it. With emergence of AIDS as one of major threat to mankind and teenage pregnancies as one of the major social problems, an

urgent need is felt, in developed as well as developing countries to make the adolescents aware of it.

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