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A Cross Sectional study on the factors affecting the age of menarche among adolescent girls in and around a medical college of Wardha Region

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ABSTRACT

INTRODUCTION: Various studies indicate that the average age of menarche has decreased significantly in the last 100 years, which there has been a secular (time-related) trend towards an earlier onset of menarche in most developed countries. In recent years, such a decline has also been observed in developing countries like India. The purpose of the present study was to asses the effect of food and social status on age of menarche in this region.

METHODS: Study included 100 girls of age group between 9 to 14 on Voluntary basis after Simple Random Sampling around the schools. After obtaining permission and consent from the school Principal/ class teacher, a predesigned questionnaire was administered and girls were briefly examined by a female doctor. . Detail information about girls and their parents were taken to know the mother's age at menarche and also to know the socioeconomic status of the family along with other details.

RESULTS: Our study shows that age at menarche in higher socioeconomic classes is lower as compare to Lower Socioeconomic class. No significant association between BMI & type of food and average age of menarche was found in our study.

CONCLUSIONS: The trend of lowering of age at menarche is well marked as we moved from lower and middle to higher socioeconomic stratum. There is paucity on such data from this region of India; hence further study needs to be done among girls from other areas of the state before the data can be extrapolated to the Indian statistics..

Keywords: Menarche, Age, Socioeconomic Status, BMI.

INTRODUCTION

Menarche is the onset of menstruation the important milestone of female adult.[1] unlike other pubertal changes that are gradual and continuous, menarche is a distinct, even with sudden onset .It is highly correlated with other pubertal characteristics and is therefore preferred as a benchmark for sexual maturation.[1]

The average age of menarche has decreased in both developed and developing countries due to improved health and nutrition. Most Indian studies have shown similar trends of decreasing age at menarche.[2,3,4]

Variation in the timing of puberty (onset/timing of menarche) are marked between well of and under privileged population with a marked delay in menarche reported in under privileged girls.[5]

Timing of menarche is an important determinant of female infertility. It also determines the chronic outcome such as cancers of reproductive organs.

Menarche is affected by genetic factors, race, environmental conditions, nutrition, physical activity, geographic location, urban or rural residence, health status, psychological factors, blindness, body mass index (BMI), family size, socioeconomic status, parental educational level, occupation of parents, loss of parents, child sexual abuse, physical stress, tea consumption, and passive smoking.[6]

The current declining and earlier menarche being experienced across the world has been linked to increased prevalence of increased body mass index, insulin resistance as well as unhealthy lipid profile culminating in higher risks of cardiovascular diseases such as hypertension, coronary heart disease, strokes and diabetes in women[7,8,9]. Furthermore, women who experience menarche before 12 years have 23% higher risk of developing breast cancer than those who first menstruate at 15 years or more[10,11]. Late menarche on the other hand presents with its own health burden since it has also been associated with osteoporosis, depression and social anxiety problems[12]

Aim of the study was to know the age at menarche and various factors s associated with age at menarche particularly Type of Nutrition and Socioeconomic Status of the Study subject females residing in and around the localities of JLMC Medical College , Sawangi , Wardha .

METHEDOLOGY

Ethical clearance was obtained from Institutional Ethical Committee of JNMC , Sawangi, Wardha . The study was carried out in the department of Anatomy. Study included total 100 girls of age group between 9 to 14 on Voluntary basis after Simple Random Sampling around the schools located near JLMC sawangi Wardha . After obtaining permission and consent from the school Principal/ class teacher, a predesigned questionnaire was administered and girls were briefly examined by a female doctor. . Detail information about girls and their parents were taken to know the mother's age at menarche and also to know the socioeconomic status of the family along with other details.

50 girls from private school and 50 girls from municipal school were choose. Data was collected from school girls of private as well as municipal school. Consent from principle and parents will be taken before detailed Interview and performing clinical examination. Study was carried out for duration of 3 months in 2019.

During the initial phase of the study the teachers and girl students were explained in local and English language the nature and importance of the study. The students willing to participate were given a written informed consent explaining the nature and confidentiality of the study to be read and signed by their parents. They were also provided with a pre-structured questionnaire to be filled by them with the help of their parents. The pre-structured questionnaire contained questions about date of birth, current age in years and months, month and year of menarche, age at menarche, history of chronic illness and medication use, socioeconomic status, mother's age at menarche and dietary habits. The birth dates were confirmed from school records. During the next visit on a date selected by the school authorities the consents and questionnaire were collected from the students. The students whose parents had consented for the study were examined clinically after a relevant interview. Confidentiality in the data collected was ensured.

The menarche age of respondents was determined using the recall method. Respondents were requested to state to the nearest whole year, how old they were when they first experienced menstrual flow.

Data collected was analysed using MS excel and EPI info version 4. Along with SPSS Version 20. Chi-square test of significance was used to test for association between various factors. A P value of $\leq$ 0.05 was considered for statistical significance.

Results

Total 100 girls in the age group of 10-14 years were included in the study.

In our study, mean age of respondents were 12.39 years with their standard deviation of 1.152.

Three parameters were mainly studied , age of menarche with the type of food taken , BMI & the level of Socioeconomic level.

Modified BG Prasad scale[13] which is used extensively in determining the socioeconomic status in health studies has been updated for the most recent Consumer Price Index (CPI) for Jan 2019. Researchers in India frequently use State-specific CPI in community health-related studies to adjust the socioeconomic status of the study area specifically[13].

For the ease of calculation the levels of Modified BG Prasad Classification is divided into two classes. Level 1 was treated as Upper socioeconomic status & all the rest levels with low values were treated as Low Socioeconomic class.

Age Menarche with Food Habit

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Table 1 – Association of Age with type of Food

Age of Menarche	Food Nature		Total
	Non Veg	Veg	
Not Started	12 48.0%	13 52.0%	25 100.0%
11-12	5 55.6%	4 44.4%	9 100.0%
12-13	12 57.1%	9 42.9%	21 100.0%
13-14	7 43.8%	9 56.2%	16 100.0%
Total	36 50.7%	35 49.3%	71 100.0%

Pearson Chi-Square 1.920 , P Value – 0.589

The P is 0.589 , hence age of menarche was not Associated with the type of food in our Study.

Table 1 reveals that chi square value at 3 degrees of freedom is 1.92 and its p value is 0.589, which indicates that data is not significant i. e. age of menarche with their food habit, is not significant. Hence we conclude that food habit is not associated with age of menarche i.e. there is no effect of being either non vegetarian or vegetarian

Table 2. Showing Association of the age of Menarche with Socio Economic Status

Age Menarche	Social Status		Total
	Low Social Status	High Social Status	
Not Started	7 (28.0%)	18 (72.0%)	25 100.0%
11-12	0 (0%)	9 (100.0%)	9 100.0%

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12-13	16 (76.2%)	5 (23.8%)	21 100.0%
13-14	13 (81.2%)	3 (18.8%)	16 100.0%
Total	36 (50.7%)	35 (49.3%)	71 100.0%

Pearson Chi-Square 19.995 , P =0.0001

Table 2 reveals that chi square value at 3 degrees of freedom is 19.995 and its p value is 0.000, which indicates that data is significantly i.e. age of menarche, is associated with their socio status. socio status is associated with age of menarche. Menarche appeared early in girls having High Socioeconomic status.

DISCUSSION

The mean menarche age in the present study is 12.39 years with their standard deviation of 1.152. This is in agreement with Purushathan (1978)[14,] Amrita et al(2000)[15] and Banerjee et al (2007)[16] they found the mean age at menarche as 12.78 years, 12.6 years and 12.3 years respectively.

The Age at menarche in different socio-economic groups was studied according to Modified BG Prasad Scale. Our study shows that age at menarche in higher socioeconomic classes is lower as compare to Lower Socioeconomic class. This figure is an agreement with study conducted in central India by Dambhare DG et al[17] according to which age of menarche in higher class is 12.89 + 1.22 years and in lower classes is found to be 13.48 + 1.35years13.and also in agreement with study conducted by Ray S et al. in west bengal[18]

No significant association between BMI & type of food and average age of menarche was found in our study. No significant association between BMI and average age of menarche was found in a study conducted by Cuatero G B et al .[19] and also in other studies like ICMR (1972)[20], Bai & Vijaylaxmi (1973) [21] and Sidhu (2002).[22]

In our study the trend of lowering of age at menarche was well marked as we moved from lower to higher socioeconomic groups. The study by ICMR (1972)[20] reveals decline in age at menarche with increase in per capita income of the family. The higher socio-economic status is usually associated with small family norms, better living conditions, proper nutrition, could be the reason for earlier growth spot and better physical and psychosexual maturity in them explaining the early onset of menarche.

The limitations of present study were the recall bias associated with reported age at menarche

CONCLUSION:

This study adds to data on age at menarche in girls from various regions of India.

The trend of lowering of age at menarche is well marked as we moved from lower and middle to higher socioeconomic stratum. There is paucity on such data from this region of India; hence further study needs to be done among girls from other areas of the state before the data can be extrapolated to the Indian statistics.

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