

A cross sectional study to determine the menarcheal age of adolescent bania girls from Punjab

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Abstract

Background: Menarcheal age is the age at which menstruation begins. Menarcheal age is regarded as a sensitive indicator of physical, biological, and psychological environment.

Objective: The objective of this study was to determine the menarcheal age of school going bania girls belonging to middle socioeconomic status from Punjab.

Materials and Methods: The present cross sectional study was carried out on 200 bania girls who were about to reach menarche. All such selected volunteer bania girls were in their pre-menstrual phase of development. Once a volunteer student attained the age of onset of menarche that is she had her first menses by the time of assessment. Data were collected using a predesigned self administrated structured questionnaire including general demographic information caste and socioeconomic status.

Results: Data were entered and analysed by using SPSS software. The median age of onset of menarche in these girls was 12.3 years.

Conclusion: The present research has revealed a secular trend over time of decreasing age at menarche from 12.8 to 12.3 in the past 15 years when compared with earlier study on bania girls. This might be attributed to better nutritional status and better hygienic practices in bania girls as these factors lead to lower age of menarche. Another cause might be the excessive use of pesticides for vegetables lead to presence of oxytocin that disrupt glands that controlling reproductive system leading to early menarche.

KEYWORDS: Menarche, bania girls, socioeconomic status


Introduction

Menarche is an important milestone in a woman's life as it denotes the start of reproductive capacity. It is regarded as sensitive indicator of physical, biological, and psychological environment.^[1] Age at menarche is more closely related

to extrinsic factors such as living conditions and especially the energy balance allocated to the individuals. Conversely, age at menopause appears to be more sensitive to intrinsic parameters such as reproductive history of an individual.^[2]

Age at menarche is different among various ethnicities. The age at menarche is reportedly 13.25 ± 0.08 years in Burma and 13.21 ± 0.11 years in Assam in girls from privileged section of society,^[3] 13.21 ± 1.33 years in urban areas of Markazi province of Iran,^[4] 11.8 years in Sri Lankan girls.^[5]

A large number of investigations on age of onset of menarche have been carried out in many parts of India but no serious attempt has been made to understand the trend of menarche in bania girls of Punjab. The mean age of reaching a particular maturational stage such as menarche can be estimated through cross sectional surveys. Cross sectional studies are cheaper and more quickly done, less time consuming and can include far large number of children. It is essential to have

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cross sectional surveys for constructing standards for height and weight and other measurements in a given community. Such periodic surveys are valuable in assessing the nutritional progress of a country or of particular socioeconomic groups.^[6]

India has population groups having diverse life styles. Excellent opportunities for growth studies exists in India, as different population groups have contrasting nutrition, socio economic status and a host of other conditions which influence growth and development of children. Because of the fast changing scenario in the income sources, food habits, health care facilities, and type of social life people are living, menarcheal age has been declined. Punjab has approximately an area of 50,362 square kilometres which forms about 1.54% of the country's total geographical area. As per census report of Government of India (2011), Punjab has a population of 27,743,338. Out of this population, females represent 13,103,873 and 14,639,465 are males. In this female population, girls in adolescent age group (10–14 years) form 1,137,872. The study will help the concerned departments of the government to decide the appropriate age of children at which the topics like sex education, contraception, sanitary practices etc. should be incorporated.

Materials and Methods

The study was conducted on 200 Punjabi bania girls. The study was approved by Institutional Ethics Committee. A written, informed consent was obtained from all the participants.

Inclusion and exclusion criteria

The sample constituted 200 healthy, unmarried school going bania girls belonging to middle class families who were in their premenstrual phase of development. Subjects having a history of malnutrition, anaemia, and family history of menstrual disorder were excluded from the present study. Care was taken to choose physically normal girls.

Area of data collection

In all, 20 schools were visited. Maximum girls were measured from SarvHitkari UtchVidya Mandir, Barnala. Data was collected from various schools of the Barnala, Tapa, Dhanula, Faridkot, viz, Sarvhitkari Vidya Mandir at Barnala, Amandeep Model School at Barnala, N.M.S.D. School at Barnala, Y.S. Public school at Barnala, Baba Farid Public School at Faridkot and Sarvhitkari Utch Vidya Mandir at Sangrur etc.

Time and period of data collection

Data was collected in the school hours from above mentioned places and period of data collection ranged from May 2011 to October 2013.

Method of data collection

Data was collected using a self administrated structured questionnaire on menstruation. The questionnaire included age, parents occupation, caste, school (government / private),

and consent of students and parents. Each girl was asked to get the form filled in by parents or guardians and to sign it and get it signed by parents or guardians. Using status quo method, every girl was asked whether she had experienced menarche. The girls included in the sample were born and brought up in Punjab state. Accurate date of birth of selected candidates was ascertained from school records and was cross checked from their parents. From the date of birth and date of examination of the girls, age of each individual was calculated up to three decimal places according to the decimal age calendar given by Tanner.^[6]

Based on the decimal age of the girls they were put in to year groups as per the method given by Singh *et al.*^[7] All girls for example, from the age group of 11.500 years to 12.499 years were put in to the group of 12 years old and so on. In the present study 200 girls were examined who fell in the 11.500 to 15.499 years. These girl students were put in to 4 groups of yearly intervals have been shown in Table 1.

Statistical analysis

For statistical analysis of the data SPSS version 16.0, Illinois, Chicago was used. The mean and median ages at menarche had been computed from decimal age.

Results

Frequency distribution of girls according to menarcheal status is set out in Table 1. It is apparent from the Table 1 that the most common age group for the onset of menarche was 12 years (11.500–12.499 years) (55%), however second most common age was 13 years (12.500–13.499 years) (37%). 8 cases (4%) had their onset at the age of 11 years and 8 cases (4%) had their onset at the age of 14 years. Thus, it can be seen that majority of the bania girls experienced the onset of menarche in the age group of 12 and 13 years as shown in Table 1. Mean and median ages for 200 bania girls were 12.36 and 12.30 years, respectively.

Discussion

In this study, maximum frequency for menarcheal age was seen for the age group of 12 years and here the number stood at 110 i.e. 55%. Minimum frequency i.e. just 8 (4%) subjects were seen for the age group of 11 years and 8 subjects for

Table 1: Age group wise distribution of subjects

Yearly-interval age groups	Number of girls in each age group	Mean age (years)	Median age (years)
11(10.500-11.499)	8	11.18	11.12
12(11.500-12.499)	110	12.01	12.07
13(12.500-13.499)	74	12.87	12.80
14(13.500-14.499)	8	13.80	13.50
Total	200	12.36	12.30

14 years. A small number of girls (37%) started menstruation at the age of 13 years. Raje^[6] illustrated in her findings that 10% of girls had attained menarche at the age of 11 years and 52.18% girls attained menarche before they were 12 years of age.

The median age at menarche for bania girls in present study was found to be 12.3 years. This is in close agreement with menarcheal ages as reported by earlier studies conducted on adolescent girls. Talwar *et al.*^[9] found the median age at menarche to be 12.88 ± 0.72 years whereas Qamra *et al.*^[10] reported 12 years and 12.8 years as mean menarcheal age of upper socio economic status and lower socioeconomic status girls, respectively. Schedule caste (Hindu Harijans) girls showed median menarcheal age of 12.23 ± 1.43 years^[11] which is also in close agreement with the present study. Median age of menarche in Turkish girls was 12.8 years^[12] nearly 5 months later than Punjabi bania girls of present study.

The present findings on bania girls are not in agreement with adolescent Punjabi girls and Jat Sikh girls of Punjab in whom median age at menarche was found to be 13 ± 1.2 years^[13] and 13.05 years,^[14] respectively.

Mokha *et al.*^[15] found that menarche is delayed in rural areas than urban areas as these girls are exposed to strenuous physical activity. Similar findings were also reported by Sharma *et al.*,^[16] Sidhu *et al.*,^[17] Ajita *et al.*,^[18] Mathur *et al.*,^[19] who found delay in menarcheal age of physically active girls than those who were not involved in any kind of physical stress. In this study, lower menarcheal age of bania girls is probably due to the fact that these girls of middle socio economic status are not involved in strenuous activity.

Bania girls of present study have been showing earlier maturation when compared with other population groups of India for menarcheal age. A study on menarcheal age of school going girls at Jhalawar district, Rajasthan reported 222 girls attained menarche ≤ 13 years where as 131 girls attained menarche ≥ 13 years^[1] whereas, another study on Agra girls showed menarcheal age of 13.40 years.^[20] Table 2 shows the comparison of menarcheal age of present study with other populations in India whereas Table 3 shows comparison of menarcheal age of present study with foreign girls.

Thus, bania girls from Punjab are ahead of other Indian girls as well as foreign girls. Earlier onset in Punjabi bania girls may be attributed to genetic background, their nutritional status, their non involvement in physical activities, changes in diet containing chemicals that mimic hormones like oxytocin present in pesticides which act as catalysts that hasten puberty. This milieu of factors may be accounting for secular trends observed in this population. Earlier we would tell parents to teach the concept of menstrual cycle when she turns 13 or 14. Now we ask parents to talk about it to their 11-or 12 year old daughters.

Earlier study conducted on bania girls from Mandi Gobindgarh reported median menarcheal age of 12.88 ± 0.72 years^[9] as compared to median menarcheal age (12.3 years) of bania girls of present study. Comparing the present findings with this similar study indicates that the average age at menarche has decreased by 0.5 years in Punjabi bania girls

Table 2: Comparative table showing the menarcheal age in Indian girls

Place	Year of study	Mean age (years)	Median age
Poona girls ^[21]	1972	13.02 ± 0.06	
Varanasi and Ramnagar ^[22]	1974	12	
Jabalpur girls ^[23]	1983	13.57	
Mumbai girls ^[24]	1998	12.0	
Punjabi Patiala girls ^[25]	1999	12.62	
Punjabi Arora girls ^[26]	2004	12.87	
Adolescent girls ^[27]	2008	12.8	
Maharashtrian girls ^[28]	2009	13.62 ± 1.05	
Uttarakhand girls ^[29]	2010	13.6 ± 1.1	
Bania girls	2016	12.3	12.3

Table 3: Comparative table showing menarcheal age in foreign girls

Place	Year of study	Mean age (years)	Median age
Greek girls ^[30]	1983	12.58 ± 0.07	
Egyptian girls ^[31]	2003	12.44	
Turkish girls ^[32]	2008	13.4	14.8
North west Ethiopia ^[33]	2009		14.8
Northern Iran ^[34]	2009	12.99 ± 1.33	
Berlin girls ^[35]	2009	12.8	12.8
US girls ^[36]	2010	13.6 ± 1.1	12.43
Canadian girls ^[37]	2010	12.72	12.67
Present stud(bania girls)	2016		12.3

over the last 15 years. Thus, in bania girls of Punjab, median age at menarche has been shifted down from 12.8 to 12.3 years in the past 15 years from 1999 to 2016. Lower age at menarche is an indicator of improved nutritional status, as this population based study on bania girls also demonstrates a secular trend.

Strengths and limitations of the present study

A major strength of the present study is the large study sample of endogamous group. We have used status quo method in this study which is considered to be even more reliable than recall method for obtaining menarcheal status. Also, cross check has been done from mothers about the menarcheal status. So, the actual menarcheal dates of the girls were known.

Secondly, through this study, the aim is to find a reference mean age and median age at menarche for Punjabi bania girls.

Thirdly, by repeating the growth study after every 10–15 years secular trends can be made clear.

We had studied only schools so uneducated girls were missed completely. So in coming future we will recommend where these girls will be included. A further limitation of the study is cross sectional character. An urgent need for longitudinal study in Punjabi bania girls is felt as none has been done on this aspect.

Conclusion

Girls of the present study started menarche much earlier than those of earlier studies. Differences might be attributed to better nutrition and better hygienic practices in bania girls. The present research has also revealed secular trend.

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