

Secular Shift in Age at Menarche in Patiala Women

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ABSTRACT The purpose of the present investigation is to illustrate the secular shift in menarcheal age in Punjabi women. Cross sectional data on two groups of women in the age group of 20-25 years and 50-60 years (spaced between 30-40 years on the time axis) from Patiala city (Punjab) were investigated during 1997 for their menarcheal ages, rhythm of the menstrual cycle and the duration of the menstrual flow. The mean menarcheal age of the older group is 15.58 years which was experienced by these women on an average around the year 1957 A.D. The younger group experienced menarche at a mean age of 12.62 years, which corresponded to the year 1987 A.D. The intensity of the secular trends in menarcheal age comes out to be one year/decade. There has been an overall improvement in the standard of living in this part of the country due to the effects of Green Revolution which took place during that period which may be responsible for the secular trends observed in this population. The rhythm of the menstrual cycle is of 27.59 days in the younger group as compared to 28.72 days in the older age group, a difference of 1.13 days which is statistically significant. The duration of the menstrual flow is longer in the younger age group (5.18 days) as compared to that in the older age group (3.93 days). May be this is an indication of the regularity of the menstrual flow with the passage of time.

INTRODUCTION

Menarche or the onset of menstruation is one of the clearest indicators of sexual maturation in females. Brought on by heightened activity of sex hormones, it marks the definite and probably the mature stage of uterine development. Almost invariably menarche occurs after the peak height velocity has been experienced. There is little, if any, increase in height after the onset of menarche (Tanner, 1978). The onset of menarche does not assure a functional reproductive system since many of the first menstrual cycles may occur without ova or with abnormal ova (Eveleth, 1998).

There are lots of ethnic and regional variations in menarche in different parts of the world (Attallah et al., 1983; Eveleth and Tanner 1990; Singh et al., 1998; Wolanski et al., 1998). Gen-

erally the cyclic rhythm of menarche is much less variable than the duration of menstrual flow. However, the menarcheal cycle has an average duration of 28 days and the duration of flow has been considered to be of 4 to 5 days. The global trends in menarcheal age indicate advancing of this developmental indicator over the successive generations. The present day girls have been experiencing it at much earlier ages as compared to their counterparts of previous generations as a result of improved lifestyle due to modernization (Wolanski, 1978, 1980; Brudevoll et al., 1979; Malina, 1979; Billewicz et al., 1981; Hoshi and Kouchi, 1981; Tanner, 1981; Low et al., 1982; Taranger, 1983; Wyshak, 1983; Bernis, 1984; Eveleth and Tanner, 1990). There are very few studies in India which have explored secular trends in the menarcheal age (Sarkar and Ray 1976; Singh and Malhotra, 1987, 1988).

The present study was planned in such a way so that information about secular trends in menarcheal age and various issues linked to the phenomenon of menstruation could be elicited. For this purpose two different groups of women of 20-25 years and 50-60 years *i.e.* spaced between 30-40 years on the time axis were studied. The findings of comparison between these two groups would perhaps yield information about secular growth shifts in menarcheal status.

MATERIAL AND METHODS

The present study has been conducted on two middle socio-economic groups of women of Patiala district; the first group of 20-25 years and the second group of 50-60 years of age. Cross-sectional data were collected on 300 females during November-December 1997. Out of these 150 females each belonged to the younger and the older age groups. The year of birth of the former age group of women can be

assessed to be between 1972-1977 A.D. whereas that of the latter group is between 1937-1947 A.D.

For recording the menarcheal age, retrospective method was adopted as the older age group had already experienced menarche many years back and were in their menopausal period. This was true for the younger counterparts also as the event had already occurred in their lives before this investigation. For ascertaining accuracy in the recall age at menarche the subjects were asked about the class in which they had experienced their first menstruation. The year was noted. Then the individual was asked about the month and finally the day of the onset of the event. If the individual was unable to recall, the event was correlated with her summer or winter vacations, with her terminal or annual exams. The recollection was also made by correlating the age at menarche with season, marriage or any other notable occurrence in the individual's life. Quite a number of individuals were able to recollect their exact date of menarche as most of the subjects were literate. Duration of flow was calculated by counting the number of days from the first spot to the day of the last spot.

RESULTS

Table 1 depicts the mean, S.D. and S.E.M. values of menarcheal age, duration of menstrual flow and rhythmic variation in the menstrual cycle of Punjabi women of two age groups. The mean menarcheal age (by recall method) is higher in case of 50-60 years old women as compared to that of the 20-25 years old women who

experienced it at much earlier ages. The average birth years of the younger age group is around 1975 A.D. and that of the older group around 1942 A.D. Reconstructing the picture on the chronological axis the average year of menarche in younger and older groups would be around 1987 A.D. and 1957 A.D., respectively. The menarcheal age during this period of roughly 30 years has advanced significantly from 15.58 years to 12.62 years, a difference of nearly 3 years. The other two indicators (cyclic variation and the duration of flow) in both the age groups indicate an average profile of these events occurring through their lives. The duration of the menstrual flow has declined with advancing age because the older group of 50-60 years old women have experienced shorter menstrual duration over the younger women. It has an average of 5.18 days as compared to 3.93 days in the older group exhibiting a statistically significant difference (Table 1). The average menarcheal cycle (no. of days) is of 27.59 days in the younger age group as compared to 28.72 days for the older one. The difference is statistically significant.

Figure 1 indicates the distribution of women experiencing menarche at different ages among the two groups. The range of occurrence of menarche in the younger age group (20-25 years) is from 11 to 17 years. The maximum frequency has been observed during the age of 12 years (42.67%) followed by 13 years (26.67%). On the other hand in the older group (50-60 years) the age range of the occurrence of menarche is between 14 and 18 years with a maximum percentage experiencing it at the age of 15 years (32.67%). The age difference between the peak frequencies (maximum) in the two groups of women is 3 years *i.e.* in the younger age group the peak is obtained at 12 years of age in comparison to 15 years in the older group.

Figure 2 illustrates the percentage distribution of menstrual flow from 2 to 7 days in both the age groups. The highest frequency was recorded for the 5-day menstrual flow group (38.0%) in case of the younger age group as compared to a 3-day menstrual flow group (35.33%) in the older age group. As depicted by the figure the maximum value of menstrual flow is recorded for the 5, 6 and 7-day clusters in the younger age group while the trend is reversed in

Table 1: Menarcheal age in two age clusters of Punjabi women

Variable	Age group 20-25 yrs			Age group 50-60 yrs			t-value
	Mean	S.D.	S.E.M.	Mean	S.D.	S.E.M.	
Cyclic variation (Days)	27.59	3.05	0.25	28.72	2.08	0.17	3.79*
Menarcheal age (yrs.)	12.62	1.18	0.09	15.58	0.90	0.08	24.66*
Duration of flow	5.18	1.19	0.09	3.93	1.23	0.10	9.32*

P < 0.05

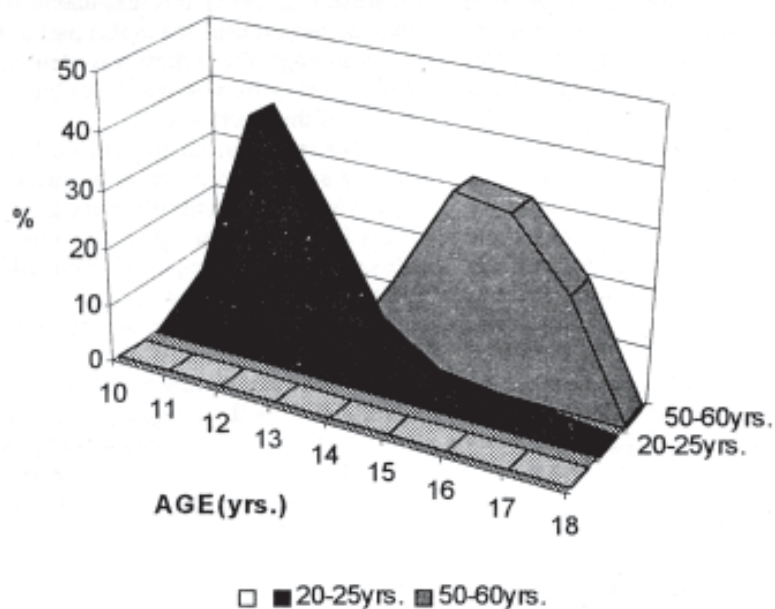


Fig. 1. Frequency distribution of menarcheal age

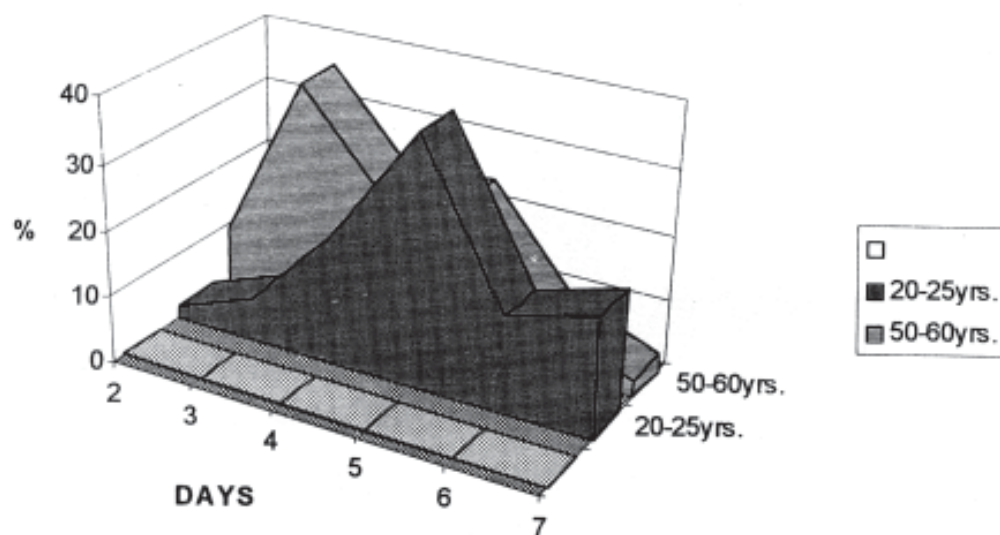


Fig. 2. Distribution of duration of menstrual flow

case of the older age group where 2, 3 and 4-day groups have the highest frequency.

Figure 3 depicts the range of variation in the average menarcheal cycle for both the groups. The shortest menarcheal rhythm (cycle) for both the groups has been recorded to be of 20 days in 0.67% of younger women and of 21 days in 1.33% of older women. The frequency increases as the menarcheal cycle increases in duration in both the age groups and attains the maximum frequency (26.0%) for 28-day cycle in younger women compared to a 29-day cycle in 31.33% in older women. The longest duration of 35-day cycle has been noticed in 2% of the younger women and 0.67% in the older women. The major difference between the two groups is that the younger group exhibits a maximum frequency for a 28-day rhythmic cycle as compared to 29-days for the older women.

DISCUSSION

The mean menarcheal age of 12.62 years in the younger age group women of the present study compares reasonably well with that obtained in the western and industrially advanced countries of the world. Other studies from the

region also reinforce the above viewpoint (Singh and Malhotra, 1987, 1988; Sharma, K., 1990; Sharma, J.C., 1991). It is reasonable to conclude that the menarcheal age in this part of the country is amongst the earliest recorded menarcheal ages not only from within India but from other places of the world also.

The results of the present study have indicated a significant decrease in menarcheal age from 15.58 years in the older age group to 12.62 years in the younger age group, spaced around 30 years on the time period. This difference is nearly of 3 years duration which can be attributed to secular shifts in maturity status in Punjabi women. The intensity of secular trends in menarcheal age comes out to be one year per decade. Putting the average year of menarche in the historic perspective, the older age group experienced it somewhere in 1957 A.D. while the younger age group experienced it during 1987 A.D. The socio-economic situation of the region has undergone dramatic changes during this period. Sixties has been the decade of the beginning of Green Revolution whose consequences were enjoyed during the seventies and the eighties. The overall standard of living during this period has increased considerably. There has

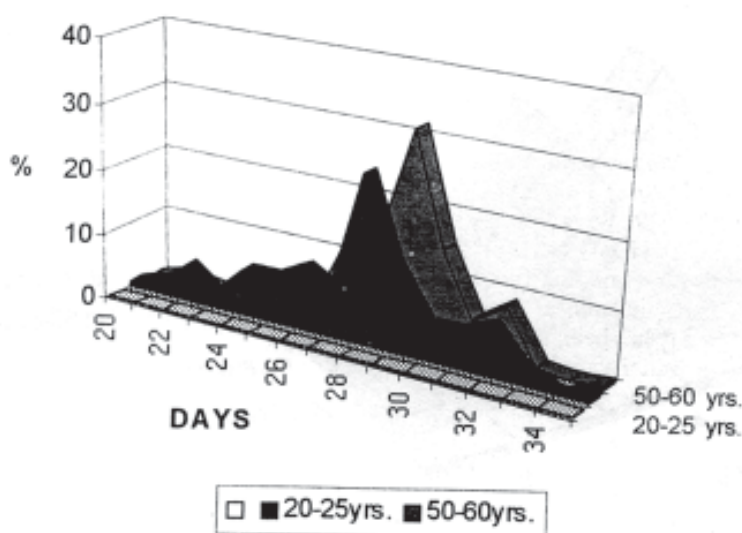


Fig. 3. Frequency distribution of variation in menarcheal cycle

been an improvement in the nutritional standards with a greater awareness and emphasis on good and balanced diet. Infectious load has also decreased and the general health and hygiene of people have also improved. Now the people have greater time and resources for leisure and recreational activities. So all these factors which have changed perceptibly between 1957 and 1987 have led to a better lifestyle. This milieu of factors may be accounting for the secular trends observed in this population. In an earlier study by Singh and Malhotra (1988) the magnitude of secular trends has been recorded as 0.3 years per decade in higher and 0.63 years per decade in lower socio-economic classes between the years 1974 and 1986.

According to Eveleth and Tanner (1990) the trend of secular change in the age at menarche has been uniform and linear in Denmark. However, a study in Norway by Brudevoll et al. (1979) has indicated a fast decline in the age at menarche in the later part of the 19th century but a slow decline in the earlier part of the 20th century. Among the reasons generally cited for the secular growth shifts both in rate of maturation and physical dimensions include improved nutrition, reduced infections, better medical care, improved immunization and sanitation, smaller family size, increased mobility etc. (Wolanski, 1980; Eveleth and Tanner, 1990). If the secular trends are because of these factors emanating from modernization, then with the improvement in the life styles of the people the secular trends should taper off gradually. Of course the data from the western countries have indicated these trends becoming marginal and coming to a standstill (Brundtland and Walloe, 1973; Tanner, 1978; Brudevoll et al., 1979; Wolanski, 1980; Hoshi and Kouchi, 1981 and Laska et al., 1982).

It is not clear from the present study whether the trend of advancing of menarcheal age during 30 years under scrutiny has been uniform or it has been bigger in the initial stages and tapering off in the later years. The other indicators linked to the menstrual process, i.e. the cyclic variation and the duration of menstrual flow in both the age groups indicate an average profile of these events occurring in their lives. The younger age group women are depicting a generalised picture of these events as it has been

occurring for a short span of time in their lives and the entire events would take some time to stabilize. Contrary to this the older age group women have already experienced these events in their lives and the entire recall is of the stabilized phenomenon. The findings have indicated a difference in the rhythm of menarcheal cycle where maximum frequency of the women have an average duration of the cycle amounting to 28 days in the younger group as compared to 29 days in the older group. On the other hand, the duration of menarcheal flow is longer in the younger age group as compared to the older age group. May be this is an indication of the regularity of the menstrual flow with the passage of time. It seems reasonable to assume that the menstrual cycle becomes more stable in a functional sense as the women advance in age.

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