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Menarcheal age of blind girls

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Abstract

Menarche is a developmental milestone. Age at which menarche is attained is highly variable and highly sensitive to a variety of internal and external forces like climatic conditions, physical and mental factors, nutrition and socio-economic status. Exposure to light and other visual cues may influence the pubertal changes. Menarcheal age (MA) of 110 blind girls was compared to that of 102 normal girls of same age group and of same area of residence. An advancement of 9 months in MA was seen in blind girls. Influence of light and other factors on menarche is discussed.

Introduction

The age at menarche is a developmental milestone which is highly variable and highly sensitive to a variety of internal and external forces **[1]**. Studies relating to different aspects of menarche are reported, which includes climatic **[2]**, physical **[3,4,5]**, mental **[6]** and socio-economic status **[7,8]**. Menarcheal age (MA) of underfed children was delayed **[9,10]**. Food habits or religion do not influence MA **[11,12]**. Urban girls mature earlier than rural girls **[13,14,15,16]**. Hypothesis of Jafarey et al **[17,18]** shows the exposure to increased length of the day due to electrification was responsible for earlier menarche among urban girls. Other studies report no difference between menarcheal age of girls in urban and rural areas **[12,19]**. Premature born girls reach menarche 1 year earlier **[20]**. Influence of special sensations, if any, is considered by few researchers **[21,22,23]**. Exposure to visual cues may have a role in activation of hypothalamo-hypophyseal-gonadal axis. Conclusion is not drawn on any single influencing factor responsible for menarche and thus it is labeled as a multi-factorial phenomenon **[24]**. We hypothesize that vision may influence the perception of menstrual phenomenon and thereby effect age of menarche. In the present study we attempted to find out the effect of light (intact vision) on menarcheal age.

Materials and methods

A total of 110 blind girls in the age group of 15-24 years from three blind schools in the state Gujarat and Bombay city were included in this study. 102 normal girls of same age group from a girls' college of same area were included as control group. The study was approved by Institutional Ethics Committee (Ref. No. BJMC/DMER/1982).

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Participants were informed about the purpose of the study and the importance of their honesty towards the success of the study. They were assured their identity would not be revealed. Questionnaire was issued to each participant. In the blind schools, one of the investigators or the teacher of the class would read out the questions to the individual participant and answers were recorded. Their age and place of stay i.e. home or hostel was also enquired. Their nature of blindness was enquired whether congenital or developed after birth, if so how many months or years after birth. Their food habit (vegetarian or non-vegetarian) was recorded. They were asked to give the date, month and year in which the first menstruation was experienced. If not knowing the exact date, they were to give the age of menarche in years and months. Participants were asked whether they were aware of menstrual process prior to menarche and if so, from whom it was learnt — mother, sister, friend, relative or teacher. What was the feeling when they experienced first menstruation — normal, dirty, messy, frightening or horrifying? At the time of first bleeding whether the participant was staying in the hostel or at home and to whom it was reported — mother, sister, friend, relative or teacher. A question about bleeding pattern was enquired - whether it was normal, profuse or less. Also the participants were to answer if experienced any other difficulties like discomfort or pain in abdomen. Similar questionnaire was issued to participants of the control group. They were instructed to fill and return the form.

Statistical analysis

Data obtained is presented as numbers and mean. Differences in the means were analyzed using independent sample t test. The statistical significance was fixed at $p < 0.05$.

Results

Participants of control group were day scholars. Out of 110 blind girls 99 were hostellers and remaining were day scholars. Sixty one from study group and all from control group were vegetarian by food habit and remaining (39) were non-vegetarians. Difference in MA was seen considering food habit.

50 out of 102 participants of control group were aware of menstruation prior to menarche and their source of information was either mother (n=10), sister (n=16), relative (n=6), friend (n=16) or teacher (n=2). These participants considered the menstrual process as normal when experienced it for the first time. While others (n=52), who did not have prior knowledge on menstrual cycle reported their experience as frightening and horrifying (n=47), or as dirty and messy (n=5). During the process, 47 of them felt slight abdominal pain or discomfort. They first reported their experience to mother (n=64), sister (n=23), friend (n=11) or a relative (n=04).

Forty three participants of study group (n=110) were aware of menstruation prior to menarche. Their knowledge was from mother (n=21), sister (n=09), relative (n=04) or a friend (n=09). They experienced bleeding as normal. Whereas others felt it as horrifying or frightening as well as dirty. At the time of menarche 41 participants of study group were staying in hostel and others were at home. Those who were staying in hostel reported about bleeding to a friend (n=30) or a teacher (n=11), whereas those who were at home (n=69) reported to mother (n=51), sister (n=11) or a relative (n=7). About bleeding pattern 31 of them experienced it as normal and for others as it was profuse or less.

The MA of study and control groups is given in **Table 1**. Blind girls reached menarche nine months earlier than normal girls. This was statistically significant when compared with that of normal.

Table 1: Menarcheal age of normal and blind girls

Group		n	Menarcheal age (years)
Normal (control)		102	14.5
Blind	Congenital	54	13.8
	Before 5 yrs (after birth)	56	13.5
	Total	110	13.6*

*Statistically significant

Discussion

Pubertal development in all society is not likely to remain same **[25]**. MA at different places in India is reported from 12 to 15.23 years **[26,27]**.

There is a secular trend of menarcheal age with time **[28]**. Parent et al **[20]** believed nutrition played a key role in secular trend. Others disagreed **[29]**. An arrest of secular trend in UK, Sweden and Belgium was reported **[30]**. Secular trend continues in India and China **[31,32,33,34,35]**. Indian classics (500 BC to 500 AD) reported 12 years as MA of that period. Dutta and Gupta **[36]** considered this age represented the data from upper caste stratum and may not be a general picture of that era.

Role of special sensations, if any, in the initiation of menstruation, was also studied. Two groups of workers did not find any difference in MA among deaf and dumb girls when compared to that of normal **[22,23]**. In the present study we collected details of MA of blind girls which was less

compared to that of normal girls in the same study area.

In our society sex education is not imparted at any level. Discussion on topic of sex is not encouraged, especially in front of elders or opposite sex. Our assurance to participants that their names would not be disclosed anywhere at any time, made them more interested and cooperative for this study. Results showed participants of control group (n=52) as well as study group (n=67) were unaware of monthly menstruation. They experienced bleeding as frightening or horrifying. Similar finding was reported in normal girls **[37]**. This situation possibly could have been avoided if they had the knowledge of sex prior to menarche. Sex education should essentially be given systematically by trained teachers.

Our data on MA from 102 girls with normal sight belonging to same age group was 14.5 years (**Table 1**). Two groups among blind girls, congenital (n=34) and acquired (n=56), did not show any statistical difference in menarcheal age. Blind girls reached menarche 9 months earlier when compared to normal girls (**Table 1**). This difference was statistically significant. Similar observation was reported by others **[21,38]**. Such difference was not seen by Thomas and Pizzarello **[39]**.

Considering their food habits, vegetarian or non-vegetarian, no difference in MA was noted between study and control group. Similar observation was reported earlier in normal girls **[12]**.

Blindness is found to be associated with an acceleration of menarche **[21,40]**. Age of menarche appears to be related to the severity of visual loss **[41]**. However, we did not observe any statistical difference among blind girls who were blind from birth and those girls who became blind at a later age (**Table 1**). Girls with total absence of light perception reach menarche earlier (7 months) than non-blind controls or girls who have little light perception (4-6 months earlier than normal) **[38]**. Others did not find difference in MA of blind girls when compared to that of normal **[39]**.

Light plays an important role in regulating hormonal secretions of pituitary gonadal axis which is responsible for sexual and reproductive functions. Environmental light reaches hypothalamic pituitary gonadal axis through secretion of melatonin from pineal gland **[42]**. In humans, the pineal gland is the source of circulating melatonin **[43]**. In blind, absence of light stimulates pineal gland by increasing melatonin secretion and which in turn disturbs pituitary gonadal axis leading to disturbance in reproductive process **[44]**. Melatonin is responsible for changes in puberty **[42,45]**. Receptors of melatonin are seen at hypothalamic pituitary level and gonadal level **[46]**. Among blind, melatonin secretion significantly disturbs circadian rhythmicity **[47]**. A correlation between melatonin and human reproductive system exists **[42]**. Melatonin is reported to increase serum prolactin and thus controls the menstrual cycle **[46]**.

Czeisler et al **[48]** in their experimental study observed that some blind people were able to perceive sense of light at visual subsystem and they maintained a normal bio rhythm.

Blind girls are under emotional stress. Influence of emotional stress on menarche is not known. Emotional stress is one of the influencing factors for ovulation in normal women **[49]**. No study is done on this line among blind girls.

Table 2: Menarcheal age reported by different authors

Place (Authors)	Menarcheal age (years)
Gujarat (Shah, 1958)	14.9
Gujarat (Trivedi, 1977)[49]	15.37
Gujarat (Skandhan et al, 1981)[7]	14.37
Gujarat (Skandhan et al, 1981)[12]	14.4
Bombay (Purandare, 1945)	13.6
Bombay (Peters and Shrikandhe, 1957)	14.5
Bombay (Kamat and Kamat , 1959)	13.3
Bombay (Shah, 1961)	14.01
Present study	14.50

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Conflict of interest:

None declared

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