

MEAN AGE AT MENARCHE IN 17 DISTRICTS OF SRI LANKA : IS THERE A SECULAR TREND ?

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SUMMARY. The mean age at menarche based on recall data from 16,809 school girls from 17 districts of Sri Lanka was 13.54 years. The geographic variation of the mean was wide and ranged from 12.97 years for Colombo to 14.08 years in Moneragala. Comparison of the means for Colombo and Kandy districts with previous published data indicate that the secular trend in menarche is now becoming apparent in Sri Lanka.

Key Words: Menarche, geographic variation, secular trend.

INTRODUCTION

Factors influencing the mean age at menarche (MAM) have been studied by a number of workers in Sri Lanka. Rural-urban differences were observed by Wilson and Sutherland (1), Kodagoda and Rajapaksa and more recently by Godawatta and Wikramanayake (2). Influence of ethnicity was observed by Arumugam and Jayawardena (3) but Balasuriya and Fernando (4) could find no difference between Jaffna Tamil girls and Sinhalese girls from Kandy. Most of the above studies were conducted in small geographical areas, the only two which compared two or three areas being the WHO Multi centre Study (5) and that of Balasuriya and Fernando (4).

The present study is an attempt to ascertain the geographic variation if any of the MAM in Sri Lanka.

MATERIALS AND METHODS

The children included in the study were mainly from the large government Central Colleges (Madya Maha Vidyalayas) from each district. In districts like Kandy and Colombo few other large schools were included while in some other districts a few Maha Vidyalayas too were included. The study covered a total of over 60,000 school children. All girls over the age of 10 years were asked to recall the date of menarche and 16,809 girls did so. Most girls recalled the exact date, month and year while a few recalled only the month and year. In the latter case, the date was taken as the 15th of the stated month. The date of birth was extracted from the school registers and the decimal age at menarche for each girl was calculated using a computer. The girls who could not recall the month and year of menarche were excluded and the percentage so excluded was less than 10.

The study was conducted during the years 1987-1989.

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RESULTS

The sample size in each district varied from a low of 256 at Anuradhapura to 2529 at Colombo (Table 1).

The MAM for the entire sample was 13.54 years with a standard deviation of 3.7 years. Values over 14 years for MAM were observed in the districts of Moneragala and Galle while Colombo district had a mean of 12.97 years (Table 1). The districts of, Polonnaruwa, Matale, Gampaha, Anuradhapura, Kurunegala and Colombo gave mean values below the overall mean. On the assumption of a normal distribution and randomness of the sample (which may not be so) the 95% confidence limits for the universal MAM is 13.52-13.56 years.

TABLE 1. Mean age at menarche by District

District	Sample size	MAM (Years)	SD (Years)
1. Moneragala	516	14.08	1.47
2. Galle	383	14.03	1.45
3. Hambantota	464	13.91	1.49
4. Nuwara Eliya	872	13.90	1.33
5. Kalutara	790	13.82	1.35
6. Ratnapura	866	13.76	1.43
7. Matara	1615	13.69	1.39
8. Badulla	1537	13.65	1.39
9. Kandy	1452	13.65	1.43
10. Kegalle	540	13.64	1.32
11. Puttalam	767	13.55	1.44
12. Polonnaruwa	665	13.50	1.37
13. Matale	1476	13.48	1.42
14. Gampaha	1202	13.42	1.28
15. Anuradhapura	256	13.40	1.46
16. Kurunegala	869	13.16	1.38
17. Colombo	2529	12.97	1.25
All districts	16809	13.54	1.37

Few recent reports on the MAM are available for the districts of Colombo and Kandy (Table 2). Our previous studies in a rural area (7) gave a value of 13.83 years while a value of 13.8 years was observed in urban Kandy (4). The sample of the present study is a mixture of rural and urban girls and the mean value obtained was 13.54 years which is even below that observed by us for urban girls in 1975. In Colombo the present sample is a predominantly rural one and the mean value of 12.97 observed is lower than the values obtained for urban girls by previous workers (4, 5, 7), and closely approximates the value observed by Godawatta and Wikramanayake (2) for rural girls in Kadawatha. The latter study was conducted around the same time as the present one. These findings indicate that there is a lowering of the MAM in the districts of Colombo and Kandy and that the secular trend observed in western countries (8, 9) is also seen in Sri Lanka.

TABLE 2. Recall mean age at menarche of Kandy and Colombo Districts based on recent studies

1	Refernces	Locality Urban/Rural	MAM
KANDY			
	Balasureiya and Fernando 1983	Urban	13.8
	WHO Multicentre Study 1986	Rural	14.44
	Balasureiya 1990	Rural	13.83
	Present Study	Rural & Urban	13.65
COLOMBO			
	David & Jayewardene 1974	Urban	13.7
	WHO Multicentre Study 1986	Urban	13.5
	Jayasekera and Goonawardena 1987	Urban	13.1
	Godawatta and Wikramanayake 1988	Urban	11.8
		Rural	13.0
	Present Study	Predominantly Rural	12.97

DISCUSSION

The present study is the only one based on a sufficiently large sample with a wide geographical coverage reported from Sri Lanka. Our sample is not representative of Sri Lanka but there were no inter district variations in the selection procedure, thus enabling us to make meaningful comparisons between the 17 districts. However, the sample size of Galle and Anuradhapura districts is small and the mean values for those two districts should be treated with caution.

On a previous occasion (4) we reported a geographic variation in the mean age at menarche in the districts of Kandy, Nuwara Eliya and Jaffna. The present study, conducted in seventeen districts suggest a wide geographical variation ranging from 12.97 to 14.08 years. We have also reported an association between the MAM and goitre (8).

The wide variation may therefore be explained at least partly in terms of the variation in the prevalence of goitre between the districts, but other causes may play a part. The districts with higher values for the MAM (with the exception of Galle, where sample size is small) are predominantly agricultural and relatively more rural than the others. The socio-economic status of the people of those areas is probably lower than those in the districts with low values, such as Gampaha, Kurunegala and Colombo. A better socio-economic status is often associated with a better nutritional status which may reflect in

an early onset of menarche. Godawatta and Wikramanayake (2) observed that in Sri Lanka the most important determinant of MAM was body size. We have shown that the presence or absence of goitre has an influence on the MAM even within small geographical areas and it is likely that the geographical variation observed is due to both factors—variation in general nutritional status and specific iodine deficiency.

A secular trend in the age of menarche has been observed in western countries (9, 10). In an extensive review of literature Bojen and Bentzon (10) state that this trend is stationary or minimal in the Eskimos and in India. Supporting evidence for the contrasting findings from India was presented by Datta and Gupta (11). The secular trend in the west has been attributed to industrialisation, urbanisation and other socio-economic conditions including better nutrition. In Sri Lanka, urbanisation and industrialisation has not been marked but improved living conditions have been observed even in rural areas. However, there is no direct evidence to support an improvement of the nutritional status. The earlier onset of menarche observed in the present study among girls from Colombo and Kandy is supportive evidence to demonstrate an improvement of the nutritional status. The decline in the MAM since 1970 in Colombo is approximately 0.7 years and is not different from the acceleration of 3-4 month per decade described by Tanner (3) for western societies.

REFERENCES

1. Wilson, DC. Sutherland I. Age at menarche. *British Medical Journal* 1950 ; 1 : 1257.
2. Godawatta R, Wikramanayake TW. Some factors influencing the age at menarche of Sri Lankans. *Ceylon Journal of Medical Science* 1988 ; 31 : 53—59.
3. Arumugam L, Jayawardena FL. A note on the age of menarche in Ceylon. *Ceylon Journal of Science (G)* 1957 ; 5 : 151—152.
4. Balasuriya S, Fernando MA. Age at menarche in three districts in Sri Lanka. *Ceylon Medical Journal* 1983 ; 28 : 227—231.
5. World Health Organization Task Force on Adolescent Reproductive Health. Multi-centre study on Menstrual and Ovulatory patterns in adolescent girls. 1. A Multicentre Cross Sectional study of Menarche. *Journal of Adolescent Health Care* 1986 ; 7 : 229—235.
6. Fernando Malcolm A, Balasuriya S, Herath KB, Katugampola S. Endemic Goitre in Sri Lanka. *Asia-Pacific Journal of Public Health* 1989 ; 3 : 11—17.
7. Balasuriya, S. Menarcheal Age and Nutritional Status of Sri Lanka girls. *Ceylon Journal of Medical Science* 1990 ; 33 : 23—26.
8. Fernando MA, Balasuriya S. Menarcheal Age and Endemic Goitre. *Asia Pacific Journal of Public Health*, 1990 ; 4 : 14—17.
9. Tanner JM. *Growth of adolescents*. Oxford : Blackwell Scientific Publications 1962.
10. Bojen K, Bentzon MW. The influence of climate and nutrition on age at menarche. A historical review and a modern hypothesis. *Human Biology* 1968 ; 40 : 69—85.
11. Datta B, Gupta D. The age at menarche in classical India. *Annals of Human Biology* 1931 351—359.