

## Appearance of Puberty Signs in Tribal Girls of Koraput, Orissa

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**ABSTRACT** Presence of puberty signs such as pubic hair, axillary hair, breast and occurrence of menarche in tribal girls were examined. In addition to the presentation of their variability in development among the adolescent girls, the median age of their appearances were estimated by Probit Analysis. The studied sample constitutes 350 normal Saora girls belonging to age group 9-18 years collected from Koraput district of Orissa.

### INTRODUCTION

Like growth during childhood, physical development during adolescence is an important indicator of community's over all health status and well being. In certain respect parents are more concerned about the latter than the former, for its social and psychological implications. At times, information on physical development are considered useful for interpreting certain demographic features (age at marriage, fertility, sterility etc.) of a community. Normal physical development though mainly dependent on biological factors like age, genetic constitution, and timely secretion of essential hormones, other factors such as environmental conditions, physical activity, nutrition and socioeconomic condition of parents have been also found capable of influencing its course. It is a movement through time and the progress may be fast or slow depending upon the factors to which the child is associated with. As a result, one finds considerable variability among the children in the time of appearance of these puberty signs. The sequence of somatic and physiological changes gives rise to the sexual maturity rating (SMR) or Tanner Stages (Behrman et al., 1996). Children of both sexes undergo rapid change in body size and shape between the ages of 10 and 20 years. Studies made on the Indian girls indicate earlier onset of puberty compared to the British girls (Prabhakar, 1972; Bai and Vijayalaxmi, 1973; Bhargava, et al., 1980 and Kaul et al., 1980). One of its reasons is believed to be the hot tropical

climate of India. Although puberty may appear to set in early among the Indian girls, full maturation seems to take longer than that among the girls of western countries. The influence of socioeconomic condition in the attainment of puberty signs has been indicated from the distinct trend of early onset among the girls in well to do families (Prabhakar, 1972 and Bai and Vijayalaxmi, 1973).

Most of the studies made in India are cross sectional, therefore, impose restrictions on drawing valid conclusion or making meaningful comparisons. Nevertheless, those have been able to indicate the extent of variability under varied environmental and real social situations. While a large body of information on pubertal growth is available for urban girls, very little is known about the same of the rural tribal in India.

The Saora are one of the oldest known tribes of Orissa, having their main concentration in Parlakhemundi and Gunpur Sub-divisions of Ganjam and Koraput districts respectively. They are mostly cultivators, but quite a few are now holding other occupations including nonagricultural daily wage labour. Majority of the people are economically backward and malnutrition among the children is apparent from their sick appearances. The present study on this community therefore, will add to the existing knowledge of the problem. The objectives of the study were to report the variability of physical development among the girls and examine the extent by which the median value of their appearance differs from that of girls of other parts of India.

### MATERIAL AND METHOD

Occurrence of four puberty signs such as pubic hair, axillary hair, breast and menstruation among the 350 girls of age 9-18 years from 13

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villages under Ramanaguda Block of Gunpur Sub-division was recorded during field investigation in May, 1992. Subjects were selected primarily on the basis of their availability but fulfilling the requirements in respect to community, age, and place of birth. Since majority of the people were illiterate and ignorant of their own age, it was not possible for many of them to tell the exact age of their children who were above age 5-7 years. In such cases, age was determined by the authors through cross verification or matching, and the recorded age is expected to be close to the exact age, if not the same. Care was taken not to include more than one child from a family and the child who was not born and brought up in the place of study. Each subject was physically examined by the present lady author (Patel). For recording the stage of development of pubic hair and breast, pictures of Tanner's puberty ratings (Tanner, 1962) were consulted. For axillary hair no stage but simple presence or absence was recorded, where as menstruation status was fixed after interviewing the girl and/or her mother or other close female relative. Probit transformation (Finney, 1952) was applied to the percentage incidence of the traits at each age, in order to estimate the median age of their appearances.

## OBSERVATION AND DISCUSSION

Frequencies of the Saora girls with different stages of the development of puberty sign and menstruation status by age have been presented in Tables 1-4. It appears that development of pubic hair among the girls takes place only after they reach 12 years of age and by age 17 years all girls of the tribe have the trait (Table 1). In fact about 91% of the girls had developed pubic hair by age 16 and only in 9%, the development took place

**Table 1: Percentage frequency of Saora girl with different stage of pubic hair development by age.**

Age years	N	Stage of pubic hair development					Presence in of pubic hair
		PH1	PH2	PH3	PH4	PH5	
9	35	-	-	-	-	-	-
10	35	-	-	-	-	-	-
11	37	-	-	-	-	-	-
12	33	-	-	-	-	-	-
13	36	88.9	8.3	2.8	-	-	11.1
14	35	62.9	8.6	20.0	5.7	2.8	37.1
15	38	31.6	10.5	18.4	26.3	13.2	68.4
16	33	9.1	3.0	15.2	45.4	27.3	90.9
17	34	-	2.9	-	32.4	64.7	100.0
18	34	-	-	-	11.8	88.2	100.0

after the age 16. Earliest appearance of the final stage of the development of pubic hair (PH5) was noticed among 2.8% of the girls of age 14. About 75% of the girls reached the final stage while they were 16-18 years of age. There were 11.8% of the girls who were at the penultimate stage (PH4) even at age 18 years.

Trend, similar to that of the appearance of pubic hair, was observed in case of the appearance of axillary hair (Table 2). At 13 years of age 27.8% of the girls had developed axillary hair, where as 91.2% of the girls of age 17 were with the trait and by age 18 no girl was left without the trait.

Though the first visible sign of breast

**Table 2: Percentage frequency of Saora girl with axillary hair by age.**

Age in years	N	Presence of axillary hair
9	35	-
10	35	-
11	37	-
12	33	-
13	36	27.8
14	35	54.3
15	38	71.0
16	33	78.8
17	34	91.2
18	34	100.0

development (B2) was noticed at the age of 10 years, its prevalence was very low. Only one i.e. 2.9% of the 35 girls of age 10 examined was with clear sign of the development breast buds. B2 stage was also observed among the girls of higher age groups, but by age 18 all the Saora girls were found to have crossed this stage. Age between 12 and 15 years appears to be the peak period for the development of breast buds. The earliest attainment of the final stage (B5) was noticed among 5.5% of the girls of age 13, while 3% of the girls of age 18 were yet to attain the same (Table 3). However, by age 16 all girls were found to have crossed B3 stage of development.

Median age of the appearance of the puberty signs as derived from Probit analysis, revealed that the breast development was the first of the studied characteristics that appeared at the median age of 12.60 years among the Saora girls (Table 5). This was followed by the appearance of pubic hair at 14.42 years and menarche at 14.25 years. Median age of the appearance of axillary hair was 14.30 years. The estimated median age of appearance of puberty signs among the Saora girls was compared with that of urban and rural girls of Orissa and India in general and with the

**Table 3: Percentage frequency of Saora girl with different stage of breast development by age.**

Age in N years	Stage of breast development					Breast developed
	B1	B2	B3	B4	N5	
9	35	-	-	-	-	-
10	35	97.1	2.9	-	-	2.9
11	37	89.2	-	8.1	2.7	10.8
12	33	69.7	-	27.3	3.0	30.3
13	36	41.7	-	27.3	25.0	58.3
14	35	11.4	-	48.6	25.7	88.6
15	38	2.6	-	27.1	44.7	97.4
16	33	-	-	6.1	39.4	100.0
17	34	-	-	-	26.5	100.0
18	34	-	-	-	2.9	97.1

**Table 4: Frequency of Saora girl who have attained menarche.**

Age in years	N	Percentage of girls menstruating
9	35	-
10	35	-
11	37	-
12	33	-
13	36	19.4
14	35	51.4
15	38	71.0
16	33	87.9
17	34	97.0
18	34	100.0

**Table 5: Median age of the appearance of different puberty signs among the Saora girls.**

Puberty sign	Median age in years
Breast development (B2)	12.60
Pubic hair appearance (PH2)	14.42
Menarche	14.25
Axillary hair appearance	14.30

timings of sexual maturity rating estimated by Tanner and Davis, 1985 for the Western girls. The first visible sign of puberty in normal healthy girls is the development of breast buds which may begin as early as 8 years. The onset of pubic hair and axillary hair follows the development of breast buds and menarche occurs in approximately 10% of girls in SMR2. As can be seen from Table 5, the Saora girls are far behind not only the urban girls of India but also the rural girls in general in the development of puberty signs. The timings of SMR2 for the four physical signs studied, among the western girls, were close to that of urban girls of Jabalpur, but not to the urban or rural girls of India in general. In spite of warm climate of India, the average age at menarche remains higher than that observed among the girls of other countries having relatively cold climate.

**Table 6: Average age of appearance of different puberty signs among the girls of various regions and categories.**

Sample	Puberty sign			
	Breast (B2)	Pubic hair (PH2)	Axillary hair	Menarche
Timing of SMR (Tanner et al., 1985)	10.9	11.2	12.9	13.0
Jabalpur (Urban) (Kaul et al., 1980)	10.99	11.48	11.53	13.57
Orissa (Urban) (ICMR, 1984)	11.00	11.00	10.99	11.38
India (Urban) (ICMR, 1984)	11.73	12.73	12.63	13.39
India (Rural) (ICMR, 1984)	12.07	13.02	13.33	14.04
Present study	12.60	14.42	14.30	14.25

In breast development (B2), the Saora girls were late by 1.58 years from the British girls (Marshall and Tanner, 1969). They were also late by 1.6 years from the urban Jabalpur girls and urban girls of Orissa, by 0.87 year from the urban Indian girls and by 0.53 year from the rural girls of the country. In the average age of appearance of pubic hair and axillary hair the Saora girls were behind by 1.40-3.42 years and 0.97-3.41 years respectively from the samples discussed above.

### CONCLUSION

From the present study it can be concluded that there exist considerable variation within the Saora community in the development of puberty signs among the adolescent girls. One of the most probable explanations of the delay in their average appearance could be prevalence of malnutrition among the children. In addition to this, influence of other common socioeconomic, genetic and environmental factors must have their contributions to the observed variability. Therefore, it demands further research to answer some of the basic questions relating to the tempo of development and the temporal relationship between the events during maturation.

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