

A Longitudinal study of weight gain among Santal and Non-Santal infants of Kankabati Gram Panchayat, West Bengal, India

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Abstract ■ A community based longitudinal study among Santal tribal and non-Santal infants and young children of Kankabati Gram Panchayat, West Bengal, India was undertaken. The objective was to compare the growth in weight of the 'studied communities. The weights of 48 boys and 51 girls were taken at one month interval over periods of up to 24 months. Among boys, there existed significant ethnic differences in mean weight at all ages except birth. Similarly, in girls, there existed significant ethnic differences in mean weights at all ages except at birth, 17 months and the duration 19-24 months. Significant sex differences ($p < 0.05$) at ages 8 and 13 months were observed among non-Santals.

Key Words: Longitudinal Study; India; Santal; Infants; Tribals;

Introduction :

India probably has the largest number of tribal communities in the world. About half of the world's autochthonous people, comprising 635 tribal communities including 75 primitive tribal communities live in India (ICMR Bulletin, 2003). According to the 2001 census conducted by the Government of India, India has a tribal population of more than 84 million, constituting 8.2% of India's population. They are found in

all states except Punjab, Haryana and Jammu & Kashmir. (Government of India, 1998). Santals (also spelled Santhal; formerly also Sonthal), the third largest tribe in India, live in many states including West Bengal, Bihar, Jharkhand, Orissa, Tripura etc. The native language of Santals is Santali, an Austro-Asiatic language. Santals are primarily engaged in agriculture. Their social system is patriarchal. Their total number in all India is nearly two

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million. In West Bengal, Santals represent 54.27% of total tribal population and they are spread over in vast areas of Purba and Paschim Medinipur, Bankura and Purulia (Bagchi, 1994). In general, the tribal populations are among the most underprivileged and undernourished people in India (Topal and Sand, 2001). This tribe lives in remote places and is characterized by poverty, illiteracy, and nutritional problems. The health status of this community remains unimproved except in a few studies (Bagchi, 1981, Ghosh et al., 2006). The prevalence of undernutrition in children is an indicator of community health status. Child growth is the universal means to assess adequate nutrition, health and development of individual children, and to estimate overall nutritional status and health of populations. Compared to other health assessment tools, measuring child growth is a relatively inexpensive, easy to perform and non-invasive process. Moreover, growth patterns of Santal children, with respect to weight, have not been investigated from Paschim Medinipur District. The objective of the present study was to compare the weight of Santal (tribal) infants and young children with the Non-Santal children of Kankabati Grampanchayat, Paschim Midnapore.

Materials and Methods

This longitudinal community based study was conducted in the villages of Kankabati Grampanchayat, Paschim Medinipur district which is 23 meters above sea-level and about 127 km from Kolkata city, the provincial capital of West Bengal. This study was conducted at monthly intervals over periods of up to 24 months from 2008 and 2010. A total of 99 (Santal boys = 17, Santal girls = 28; non-Santal boys = 31, non-Santal girls = 28) young children aged 0-24 months were measured. Parents were informed about the objectives of the study and their consent was obtained. The study

protocol was approved by the institutional ethical committee. Information on age, gender and weight was collected on a pre-tested questionnaire by house to house visit following interview and measurement.

Weights were measured by a trained investigator (AS) according to standard procedures (Tanner, 1969). Weights were measured in the nude to the nearest 109 on infant beam balance. The balance was calibrated before the start of each day's measurements. Statistical analyses were done using SPSS 16 software. Student's t-test were undertaken to test for sex and ethnic difference.

Results

Table 7 shows the mean, standard deviation and t-HSE Villages of the Santal (tribal) and non-Santal infants of Kankabati Grampanchayat, West Bengal. It was observed that non-Santal boys and girls had greater means in all 24 months than Santals despite of their close place of residence.

Among boys, there existed significant ethnic difference in mean weight at all ages except birth. Similarly, in girls, there existed significant ethnic difference in mean weights at all ages except at birth, 17 months and the duration 19-24 months. Significant sex difference ($p < 0.05$) at 6 and 13 months were observed among non-Santals. There was no significant sex difference observed among the studied Santal infants and young children.

Maximum weight gain among non-Santal boys was observed at age 0 – 1 months (+0.93 kg) and among non-Santal girls at age 0 – 1 months (+0.92 kg). Similarly, minimum weight gains among non-Santal boys were observed at age 13 – 14 months (+0.10 kg) and among girls at ages 18 – 19 and 19 – 20 months (+0.10 kg). We observed maximum weight gains among Santal boys at age 3 – 4 months (+0.74 kg) and among girls at age 1 – 2 months (+0.68 kg).

Table 1: Mean (sd) of weight among Non-Santal and Santal infants and young children

Age (months)	Boys			Girls		
	Non-Santal N=11	Santal N=17		Non-Santal N=28	Santal N=113	
0	2.75 (0.28)	2.66 (0.28)	1.012	2.83 (0.43)	2.69 (0.42)	1.120
1	3.68 (0.48)	3.29 (0.38)	2.919**	3.75 (0.62)	3.20 (0.50)	3.395**
2	4.40 (0.66)	3.77 (0.56)	3.349**	4.47 (0.69)	3.88 (0.41)	3.610***
3	5.32 (0.74)	4.32 (0.53)	4.871***	5.21 (0.74)	4.38 (0.57)	4.412***
4	5.95 (0.79)	5.06 (0.57)	4.086***	5.82 (0.65)	4.80 (0.60)	5.762***
5	6.44 (0.78)	5.50 (0.53)	4.430***	6.28 (0.65)	5.29 (0.65)	5.384***
6	6.93 (0.83)	5.91 (0.50)	4.593***	6.69 (0.60)	5.81 (0.60)	5.156**
7	7.08 (0.89)	6.10 (0.50)	4.553***	7.01 (0.62)	6.10 (0.61)	4.860**
8	7.08 (0.88)	6.61 (0.67)	4.500**	7.55 (0.59)	6.51 (0.61)	4.163**
9	7.94 (0.17)	7.05 (0.4)	3.290***	7.53 (0.62)	6.87 (0.71)	3.639
10	8.23 (1.0)	7.21 (0.7)	3.634***	8.22 (0.62)	7.06 (0.77)	3.923***
11	8.42 (0.6)	7.46 (0.3)	3.846***	8.08 (0.67)	7.28 (0.72)	4.115**
12	8.21 (0.6)	7.89 (0.7)	3.080***	8.28 (0.76)	7.43 (0.73)	4.033**
13	8.88 (1.0)	8.06 (0.7)	2.894**	8.40 (0.77)	7.60 (0.78)	3.677**
14	8.88 (0.9)	8.25 (0.4)	2.731**	8.52 (0.8)	7.86 (0.72)	3.200**
15	8.11 (0.1)	8.35 (0.8)	2.773**	8.78 (0.92)	8.11 (0.73)	2.788
16	8.10 (0.1)	8.52 (0.8)	2.06**	8.2 (0.94)	8.31 (0.7)	2.311**
17	9.40 (1.0)	8.66 (0.8)	2.45**	9.06 (0.8)	8.59 (0.8)	1.819
18	9.51 (1.0)	8.78 (0.8)	2.517**	9.23 (0.9)	8.71 (0.8)	2.050**
19	9.63 (0.92)	8.25 (0.9)	2.284**	9.33 (0.98)	8.90 (0.76)	1.71
20	9.78 (0.9)	9.13 (1.02)	2.271**	9.43 (1.0)	9.04 (0.79)	1.101
21	9.91 (0.92)	9.31 (1.0)	2.059**	9.56 (1.05)	9.29 (0.8)	0.284
22	10.0 (0.91)	9.52 (0.7)	2.045**	9.72 (1.02)	9.49 (0.8)	0.864
23	10.28 (0.97)	9.62 (0.94)	2.302**	9.90 (1.16)	9.74 (0.88)	0.536
24	10.00 (0.8)	9.91 (0.8)	2.04	10.05 (1.1)	9.90 (0.9)	0.009

Standard deviations are presented in parentheses. Asterix in the table refers to significant ethnic differences. * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$.

Similarly, minimum weight gain was observed among Santal boys at ages 14 — 15 and 22 — 23 months (+0.10 kg) and among girls at age 17 — 18 months (+0.12 kg).

Discussion :

Figure J highlights the comparative ethnic and sex differences in mean weight among Santal and non-Santal children. It is clear that non-Santals were significantly heavier than Santals.

A noteworthy observation among girls was that there existed no significant ethnic difference in mean weight during the duration 19-24 months.

This implied that both these ethnic groups were experiencing similar nutritional stress during this later period. In other words, the nutritional deficit was not ethnic-specific. It is probable indicative of gender discrimination rather than ethnic disparity in nutritional intake. Interestingly, both the ethnic groups had similar

weights before 1 month of age. This is suggestive of the fact that the additional nutritional stress being faced by Santals, as compared to non-Santals during infancy and early childhood, was absent at birth.

Children are the most important assets of a country because they will be tomorrow's youth and provide the human potential required for its development. Nutrition in the early years of life plays a big role in physical, mental and emotional development. Possibly the primary cause of underweight among the Santals observed in the present study is maternal malnutrition and inadequate consumption of calorie and protein along with socioeconomic status, hygienic condition, sanitation, life style, education etc. Other important factors like infection, adverse cultural practices of child care, breast feeding and weaning may be responsible for this nutritional deficit.

Unfortunately, one of the limitations of our study was the absence of data on these variables. Comprehensive child survival programmes and supplementary feeding practices are required to enhance the nutritional status of Santal infants. In the present study, we have covered only a limited sample of Santal and non-Santal children. We feel that further detailed research on larger sample sizes incorporating the study of related socio-economic and socio-demographic are required to obtain a clearer insight into the likely causes of this nutritional deficit among Santal infants. Moreover, similar studies should be undertaken on pre-school children and adolescents to determine whether this nutritional stress exists among them. Lastly similar studies should be undertaken among other tribal infants and children from different parts of India. To the best of our knowledge,

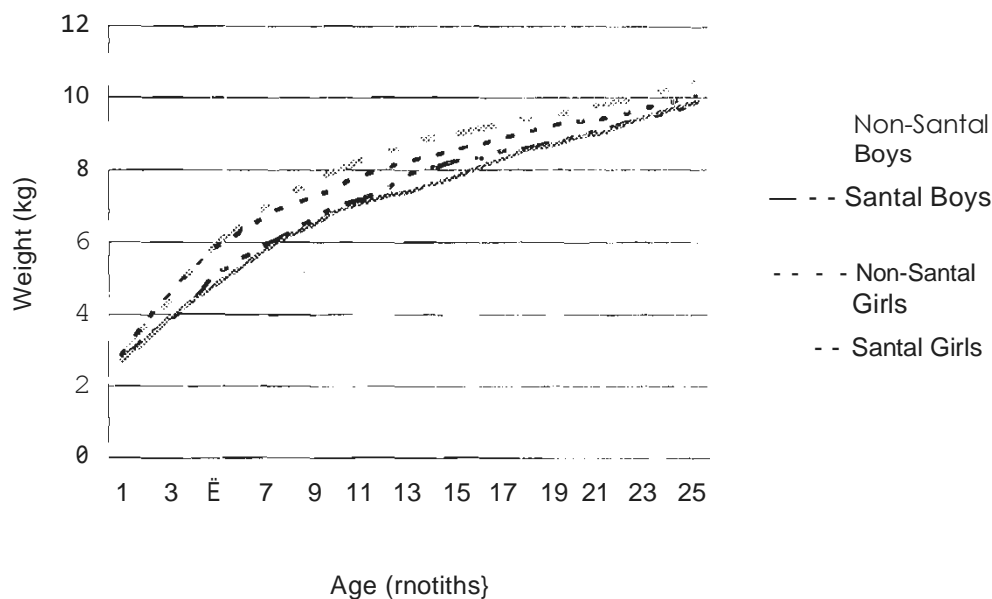


Figure 1. Mean weight (kg) of the Santal and non-Santal infants and young children.

longitudinal studies dealing with growth patterns of tribal children are hitherto non-existent from

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