

Original Research Article

Variations in somatometric and somatoscopic characters among the Santhals of Dumka district, Jharkhand

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ABSTRACT

Background: Baseline data collection is always very important for the planning and upliftment of any community. It determines the requirement in a more specific manner, thereby acting as an indicator, which can be used to monitor and evaluate any project. With this intention the Santhal people of Dumka in the state of Jharkhand, have been studied to prepare a baseline of their body measurements as well as their somatoscopic observations.

Methods: A total of 206 adult Santhal sample has been collected, of which 111 are females and 95 are males. The data was collected with respect to 17 somatometric variables, 3 anthropometric indices and 24 somatoscopic observations.

Results: The mean age of Santhal males in the present study is 35.72 years and the mean age of the females is 32.45 years. A typical Santhal of Dumka, Jharkhand is of short stature, with a hyper dolichocephalic head, females with a mesorrhine nose and the males with platyrrhine nose. The nasal index could be an adaptive strategy of survival among them. They have a euryprosopic face. Their skin colour is dark brown. Hairs are coarse, broad wavy and black in colour, which are medium in quantity. Their eyes dark brown in colour has a marked epicanthic fold. The supraorbital ridges are continuous with a broad forehead. They have a medium facial prognathism with thick lips. The Santhals of Dumka are therefore a well-adapted population of the region.

Conclusions: Santhals of the present study show all the characters of Austro-Asiatic classification.

Keywords: Adult Santhals, Anthropometric indices, Austro-Asiatic, Dumka, Somatometric variables, Somatoscopic observations

INTRODUCTION

To sketch a complete picture of any community, somatoscopy and somatometry are indispensable. Somatometry quantitatively expressing the morphology of human body and somatoscopy is the qualitative expression of human body. The diversity of morphology becomes clearer with somatoscopy. It becomes an identity for someone to be recognised by others. Not only this, the findings of human physical variation are widely used in the fields of education, health, forensics, genetic counselling, industry etc.¹ Anthropometry therefore

stands important for measuring and describing the physical differences of the population groups.

Somatoscopic observations helps in identifying racial or ethnic type. The study of somatoscopic observations is important for understanding variations among the individuals, for establishing common morphological features for a group of individuals, a community or an ethnic group which itself is an objective of physical anthropology. Individual personal identification that is an indispensable task of forensic scientist is based on somatoscopic observation.

Somatoscopic observations were adopted for clinical examination to record the presence and absence of deficiency signs in general appearance for a nutritional study.² The study was done among the Hill Korwa children till 6 years of age in Sarguja district, Chhattisgarh. Clinical examination adopted the presence and absence of deficiency signs in general appearance, hair, eyes, lips, tongue, skin, and nails. The WHO designed structured schedule was used to assess the subjects physically from head to foot. Malhotra et al studied the somatoscopic variation among five endogamous castes of Delhi region - Ahir, Chamar, Jat, Gujjar and Rajput.³ The most striking differences were found between Chamars and the rest of the castes, in characters such as pigmentation of skin and tongue, lip protrusion, hypertrichosis, mid digital hair etc. The Rajput differed from the remaining four castes mainly in pigmentation of the eye and skin and certain features of the nose. High incidence of light eyes, light skin colour, and convex nose were found among the Gujjars.

The wide array of applications also includes providing a baseline for the study of any population, in the field of workplace ergonomics, providing an insight into the study of human fossils, thereby helping the palaeontologists understand the evolutionary processes, doctors assessing any anomaly in growth at the individual level and the anthropologists at the population level.

The purpose of baseline data collection is therefore always very important for the planning and upliftment of any community. It determines the requirement in a more specific manner, thereby acting as an indicator, which can be used to monitor and evaluate any project.

It is with this intention that the Santhal people of Dumka in Jharkhand are been studied to prepare a baseline of their body measurements as well as their somatoscopic observations.

As per WHO, observation of hair -regional amount and texture, form, colour and distribution of head hair, eye form, eyebrows, brow ridge and forehead, chin prominence, lips, nose and ear forms are essential for studies in population genetics. Other than these for studying human variations anthropologist also use skin colour, facial and alveolar prognathism, cheek and jaws as some of the important somatoscopic observations.

The people

The Santhal, one of the populous tribal communities of India, are mainly found in the state of Jharkhand, Bihar, Odisha, and West Bengal. There is also a significant Santhal minority in neighbouring Bangladesh, and a small population in Nepal. Santhals are the largest inhabiting tribe of the state Jharkhand and they are mainly concentrated in the Santhal Pargana division and its constituencies. The present study confined itself to Dumka district of Jharkhand (Figure 1). Santhal Pargana

is one of the divisions of commissioners of Jharkhand. Its headquarters is at Dumka and under these subdivisions, there are namely 10 blocks and among them, one is Dumka itself.

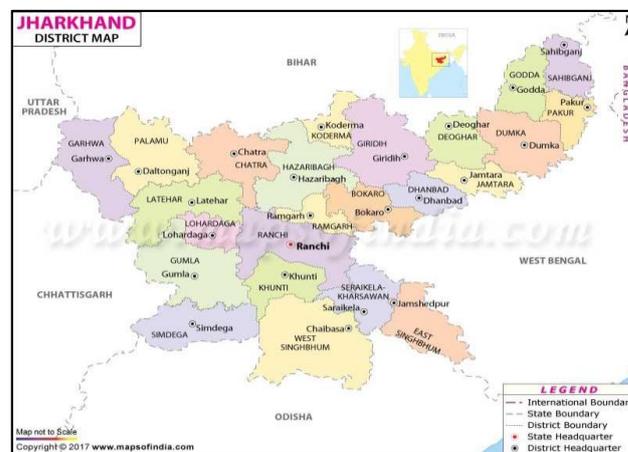


Figure 1: Map of Jharkhand showing the study area.

The Santhal language, Santhali, belongs to the North Mundari Group of languages, itself part of the Austroasiatic language family. Norwegian missionaries introduced writing in the late nineteenth century, and so Santhali literature uses Roman characters. More recently, Santali is been written in Devanagiri. The Santhals are divided into 12 exogamous clans or gotras, which are Hansda', Murmu', Kisku', Hembrom', Marandi', Soren', Tudu', Baske', Besra', Pauria', Chonre' and Bedea'. They could put their titles in the name of their gotras. They are patrilineal.

METHODS

The present study was conducted among the Santhals of Dumka, Jharkhand. The data was collected by cross sectional method from the rural areas of Dumka. Purposive sampling was used for the data collection from five villages of Dumka district, viz; Sri Amra Kamartola, Bartalli, Rajbandh, Mayurnacha, Jaypahari. The field work was carried out during the period from 25th March to 7th April 2019. A total of 206 samples has been collected, of which 111 are females and 95 are males. The sample of 206 adults is been arranged in seven different age groups from 20 to 50 and above years of age at an interval of four years. The adults who have completed 50 years or more are placed in a single group.

It is very difficult to get the correct age because in many parts of rural India people do not possess birth certificates. Special care therefore has been taken to obtain the actual age from those who possessed high school leaving certificates and has been confirmed by the key informant who was a teacher and a resident of the village. Males and females with congenital or acquired external deformities and with family history of marriage with other communities are been excluded.

The data was collected with respect to the following 17 somatometric variables, 3 indices and 24 somatoscopic observations. The measurements which were taken into consideration are stature, sitting height vertex, lower extremity length, head length, head breadth, minimum frontal diameter, bizygomatic breadth, bigonial diameter, nasal height, nasal breadth, total facial height, upper facial height, horizontal circumference of head, girth of thorax, girth of bicep, girth of calf and body weight. All somatometric measurements were taken using the standard techniques of Lohman et al.⁵ The height and sitting height were measured by using an anthropometer rod to the nearest 1 mm, while the circumferences were recorded using a non-stretchable plastic-coated measuring tape on the left side of the body to the nearest 1 mm. A spreading caliper and a sliding caliper was used for the head and facial measurements. Weight was measured using a portable weighting machine to the nearest 0.1 kg.

Cephalic index, nasal index, total facial index were calculated and described as by Martin and Saller.⁶

Somatoscopic observations were carried out in broad daylight for accuracy. Some of the important somatoscopic parameters studied are hair on head (colour, form, texture, quantity), skin colour, palpebral opening (axis, size), epicanthic fold, eye colour, sclera, iris, supraorbital ridges (form, size), forehead (height, breadth, slope), nose (nasion depression, nasal profile, nasal septum), lips (size, eversion) and prognathism (alveolar, facial, malar).

Skin colour is a parameter with different degrees of variation based on exposure to light and heat. Some parts of the same body have a degree of colour that varies depending on the extent of exposure. Skin exposed to sunlight tends to be darker than those not exposed. Different portions of the body show different skin colour, out of which a few parts are usually taken into consideration, such as, the forehead, chest, shoulder blade and inner side of the upper arm. In the present study, the part of the skin on the inner surface of the upper arm was observed because it is slightly exposed to sunlight. Furthermore, the skin colour observed is been compared to the standard colour scale, the Luschan's skin colour chart that is distinguished by 36 degrees of colour on a scale of 1-36.^{1,7} Hair colour is the result of the mixing ratio of two types of melanin that occurs, namely blackish eumelanin and yellowish pheomelanin.⁸ Hair colour evaluation is been done based on Fischer-Saller Scale.⁹ It is A: blonde, B-E: light blonde (straw), F-L: blonde, M-O: dark blonde, P-T: light brown to brown, U-Y: dark brown to black, I-IV: reddish, V-VI: reddish blonde.¹⁰

Hair texture has been classified according to Martin and Saller, he has categorized into varieties, i.e. straight, sleek, flat waved, broad waved, narrow waved, curly, frizzly, widely knit, closely knit, peppercorn, spiral.⁶

Eyes have been observed for palpebral opening (axis and size), epicanthic fold, iris (colour) and sclera. The axis of eye was viewed from the inner part of the eye where the upper and the lower eyelids meet to the lateral side, where the lower and upper eyelid margins meet (outer canthus). By considering these two points, a line is drawn and observed whether it is horizontally inclined inwards or inclined outwards. Invariably the Caucasoids and Negroids have horizontal axis while the Mongoloids exhibit inward or outward slant in the axis of the eyes. The Mongoloids invariably exhibit a typical type of fold which is known as the epicanthic fold. Due to the presence of this fold they cannot open their eyes completely and it appears that their eyes are half open or the half eye is closed. The fold covers the iris portion to a level that the complete iris is not seen. The iris has a variety of colours caused by the melanin pigment in the iris epithelial layer. The colour of the iris is one of the most obvious characteristics in humans. The iris colour evaluation has been done using Martin and Schultz Eye Colour Chart.⁷ It was measured by a lens and described by the following terminology-homogeneous, or rayed, or zoned, or speckled, or diffused. Nose is one of the most important features of the face, which is used for identifying people as well as discriminating them from different ecological regions. The profile of the nose as seen from the side is known as nasal bridge is been classified as straight, concave, convex or angular.

Statistical analysis

The data were statistically analysed using relevant statistical tests. The descriptive statistical analysis of the anthropometric measures is depicted in terms of mean and standard deviation (\pm SD). The independent sample t-test was done to assess sex differences in the anthropometric variables. Chi-square analysis (χ^2) was used to assess the differences in the somatoscopic observations and somatometric indices between the sexes. All the differences were considered to be statistically significant at $p < 0.05$ level.

RESULTS

The descriptive somatoscopic observations of the non-elderly Santhal males and females are presented in Table: 1 to 3. The variables were collected from the males and females of less than 50 years of age. The mean age of Santhal males in the present study is 35.72 years and the mean age of the females is 32.45 years. From Table: 1, it could be seen that the skin colour of the Santhals of Dumka are predominantly dark brown. The males have 68.42% and females have 62.16% of dark brown colour skin colour. The variations found in the skin colour is statistically insignificant between the sexes at the level of 5%. Black hair colour is in highest percentage in both the sexes, it is 63.16% among the males and 61.26% among the females (Table 1).

Table 1: Somatoscopic observations on skin colour, hair and prognathism among the Santhals of Dumka.

Observations	Male (n=95) N (%)	Female (n=111) N (%)	Chi-square values	Probability	Significance*
Skin colour					
Fair	0	0	3.8622	0.276739	NS
Light Brown	13 (13.68)	14 (12.61)			
Brown	15 (15.79)	19 (17.12)			
Dark Brown	65 (68.42)	69 (62.16)			
Yellowish Brown	2 (2.1)	9 (8.1)			
Hair colour					
Black	60 (63.16)	68 (61.26)	1.3563	0.715803	NS
Brown	17 (17.89)	20 (18.02)			
Grey	7 (7.37)	13 (11.71)			
White	11 (11.58)	10 (9.01)			
Hair form					
Flat wavy	18 (18.95)	26 (23.42)	1.722	0.632121	NS
Broad wavy	40 (42.11)	51 (45.95)			
Narrow wavy	28 (29.47)	25 (22.52)			
Curly	9 (9.47)	9 (8.11)			
Hair texture					
Coarse	52 (54.74)	53 (47.75)	4.0574	0.131505	NS
Medium	35 (36.84)	38 (34.23)			
Fine	8 (8.42)	20 (18.02)			
Hair quantity					
Scanty	20 (21.05)	28 (25.23)	1.464	0.480942	NS
Medium	42 (44.21)	40 (36.04)			
Rich	33 (34.74)	43 (38.74)			
Alveolar prognathism					
None	0	0	3.39	0.183604	NS
Slight	5 (5.26)	8 (7.2)			
Medium	35 (36.84)	53 (47.74)			
Marked	55 (57.89)	50 (45.04)			
Facial prognathism					
None	0	0	2.4782	0.289648	NS
Slight	12 (12.63)	22 (19.81)			
Medium	69 (72.63)	70 (63.06)			
Marked	14 (14.73)	19 (17.12)			
Malar prominence					
None	0	0	2.7336	0.434555	NS
Slight	7 (7.36)	4 (3.6)			
Medium	36 (37.89)	40 (36.03)			
Pronounced	29 (30.52)	31 (27.92)			
Bulky	23 (24.21)	36 (32.43)			

*Significant at 5% probability level; NS: non-significant

Brown hair colour is the second highest in frequency, which is 17.89% for the males and 18.01% for the females. The sexual variations found in the hair colour is also insignificant at 5% level. In the same table, it could be seen that the hair form among the people is broad wavy in both the sexes (42.11% among the males and 45.94% among the females). Flat wavy and narrow wavy are also present in lesser frequency. Less than 10% also have curly hairs (9.47% among the males and 8.10% among the females).

Highest percentage of them have coarse hairs, which is 54.73% in males and 47.74% in females followed by medium textured hairs. Fine hairs are in lesser frequency. Sexual variations found in hair form, texture and quantity are at an insignificant level. They have medium quantity of hairs (44.2% among the males and 36.03% in females). The observations on eyes among the Santhals of Dumka shows that, they have an oblique downwards axis of their eyes (56.84% among the males and 56.75% among the females) (Table 2).

Table 2: Somatoscopic observations on eyes and forehead among the Santhals of Dumka.

Observations	Male (n=95) N (%)	Female (n=111) N (%)	Chi-square values	Probability	Significance*
Eyes palpebral opening					
Axis					
Straight	22 (23.15)	38 (34.23)	6.5489	0.037838	S
Oblique (up)	19 (20)	10 (9)			
Oblique (down)	54 (56.84)	63 (56.75)			
Size					
Narrow	6 (6.31)	13 (11.71)	1.827	0.401117	NS
Medium	45 (47.36)	48 (43.24)			
Broad	44 (46.31)	50 (45.04)			
Epicanthic fold					
Absent	0	0	7.7348	0.005417	S
Trace Medium	4 (4.21)	18 (16.21)			
Marked	91 (95.78)	93 (83.78)			
Eye colour					
Black	3 (3.15)	8 (7.20)	18.0572	0.002876	S
Dark brown	37 (38.94)	33 (29.72)			
Brown	11 (11.57)	18 (16.22)			
Light brown	21 (22.10)	7 (6.30)			
Blue brown	18 (18.95)	30 (27.02)			
Grey brown	5 (5.26)	15 (13.51)			
Sclera					
Clear	0	0	2.6694	0.102297	NS
Speckled	90 (95)	98 (88.28)			
Yellow dull	5 (5)	13 (11.71)			
Iris					
Homogenous	4 (4.21)	10 (9)	4.6744	0.096597	NS
Rayed	87 (91.57)	90 (81.08)			
Zoned	0	0			
Speckled	4 (4.21)	11 (9.90)			
Diffuse	0	0			
Forehead					
Height					
Low	0	0	2.8833	0.09501	NS
Medium	17 (17.89)	31 (27.92)			
High	78 (82.10)	80 (72.07)			
Breadth					
Narrow	0	0	1.353	0.244828	NS
Medium	27 (28.42)	40 (36.03)			
Broad	68 (71.57)	71 (63.96)			
Slope					
None	11 (11.57)	11 (9.91)	0.8696	0.832746	NS
Slight	44 (46.31)	50 (45.04)			
Moderate	38 (40)	49 (44.14)			
Medium	2 (2.1)	1 (0.901)			
Pronounced	0	0			

* Significant at 5% probability level

The variation in the axis of the palpebral opening between the sexes is statistically significant but the size in palpebral opening is not significant. They have a marked epicanthic fold of their eyes (95.78% in males and 83.78% in the females) with medium and broad palpebral

opening in almost similar frequency. The variation between the sexes in epicanthic fold is statistically significant. The highest percentage of eye colour among them is dark brown (38.94% of males and 29.72% of females). Brown and light brown eyes are also prevalent

among them. Black eyes are in lesser frequency (3.15% in males and 7.20% in females). The sexual variation in eye colour is statistically significant among them. The iris of their eyes is mostly rayed and the sclera speckled but the difference between the sexes is insignificant. The prominence of massive supra orbital ridges is widely prevalent in both the sexes (81.05% among the males and 79.28% among the females), as seen in Table 3.

The ridges are continuous among the females (54.05%) and discontinuous among the males (56.84%) in higher frequency. Though the difference between the sexes is at an insignificant level. The presence of medium supraorbital ridges is in lesser frequency. They have a broad high forehead with a slight to moderate slope. The variations in the forehead between the sexes is statistically insignificant.

Table 3: Somatoscopic observations on Supraorbital ridge, nose and lips among the Santhals of Dumka.

Observations	Male (n=95)	Female (n=111)	Chi-square values	Probability	Significance*
	N (%)	N (%)			
Supraorbital ridge					
Form					
Continuous	41 (43.15)	60 (54.05)			
Discontinuous	54 (56.84)	51 (45.94)	2.4319	0.118887	NS
Size					
Perceptible	0	0			
Medium	18 (18.94)	23 (20.72)	0.101	0.750657	NS
Massive	77 (81.05)	88 (79.28)			
Nose					
Depression					
None	0	0			
Shallow	0	0	0.039	0.843258	NS
Medium	7 (7.36)	9 (8.1)			
Deep	88 (92.63)	102 (91.89)			
Nasal Bridge					
Straight	17 (17.89)	22 (19.81)			
Concave	36 (37.89)	40 (36.03)	0.1482	0.928584	NS
Convex	0	0			
Concavo-convex	42 (44.21)	49 (44.14)			
Nasal septum					
Horizontal	60 (63.15)	61 (54.95)	1.421	0.23321	
Upward	35 (36.84)	50 (45.04)			NS
Downward	0	0			
Lips					
Size					
Thin	0	0			
Medium	24 (25.26)	38 (34.23)	1.9582	0.16171	NS
Thick	71 (74.73)	73 (65.76)			
Eversion					
Absent	0	0			
Slight	0	0	2.6633	0.10269	NS
Medium	33 (34.73)	51 (45.94)			
Marked	62 (65.26)	60 (54.05)			

* Significant at 5% probability level

Table 4: Descriptive statistics of body measurements among the Santhal males and females.

Somatometric measurements	Mean±SD		T-values	Probability	Level of significance
	Males	Females			
Height vertex	159.67±6.52	150.45±5.62	10.901	p<0.0001	S
Sitting height vertex	78.9±4.07	74.07±4.59	7.929	p<0.0001	S
Lower extremity length	74.1±5.07	68.83±4.72	7.72	p<0.0001	S
Head length	16.92±0.74	16.35±0.66	5.843	p<0.0001	S
Head breadth	11.87±0.73	11.61±0.61	2.7855	p=0.0059	S

Continued.

Somatometric measurements	Mean±SD		T-values	Probability	Level of significance
	Males	Females			
Min. Frontal diameter	8.94±0.68	8.12±0.60	9.194	p<0.0001	S
Bizygomatic breadth	10.41±0.54	9.93±0.64	5.762	p<0.0001	S
Bigonial diameter	9.26±0.67	8.56±0.70	7.297	p<0.0001	S
Nasal height	4.7±0.36	4.47±0.31	4.927	p<0.0001	S
Nasal breadth	3.9±0.32	3.53±0.26	9.154	p<0.0001	S
Total facial height	10.69±0.69	9.9±0.55	9.139	p<0.0001	S
Upper facial height	6.14±0.46	5.76±0.45	5.98	p<0.0001	S
Hor. circ. head	53.79±1.64	52.51±1.60	5.658	p<0.0001	S
Girth of thorax	83.11±5.71	81.76±8.28	1.34	p=0.1819	Ns
Girth of bicep	24.22±2.44	23.81±2.84	1.101	p=0.2720	Ns
Girth of calf	28.57±4.38	29.77±3.46	2.195	p=0.0293	S
Weight	50.11±6.39	42.41±7.92	7.593	p<0.0001	S

*significant at 5% probability level

Table 5: Somatometric Indices among the Santhal males and females.

Indices	Male		Female		Chi-square
	N	%	N	%	
Cephalic index					
Hyper dolichocephalic (-70.9)	58	56.31	56	50.45	11.1308*
Dolichocephalic (71.0-75.9)	27	26.21	47	42.34	DF = 3
Mesocephalic (76.0-80.9)	10	9.71	7	6.3	
Brachycephalic (81.0-85.4)	8	7.77	1	0.9	
Hyper brachycephalic (85.5-)	0		0		
Ultra-brachycephalic	0		0		
Nasal index					
Hyperleptorrhinae (-54.9)					
Leptorrhinae (55.0-69.9)	7	6.8	10	9.01	17.2551*
Mesorrhinae (70.0-84.9)	41	39.81	72	64.86	DF = 3
Platyrrhinae (53.0-56.9)	51	49.51	28	25.23	
Hyperplatyrrhinae (57.0+)	4	3.88	1	0.9	
Total facial index					
Hypereuryprosopic (78.9-76.9)	1	0.97	1	0.9	5.1743
Euryprosopic (79.0-83.9)	86	83.5	99	89.19	DF = 3
Mesoprosopic (84.0-87.9)	9	8.74	10	9.01	
Leptoprosopic (88.0-92.9)	7	6.79	1	0.9	
Hyperleptoprosopic (93.0+)	0		0		

*significant at 5% probability level

The nose is a person’s most defining feature because of its location. They have a deep nasal depression, which is present in 92.63% of males and 91.89% of females (Table 3). The nasal bridge is concavo-convex in 44.21% of males and 44.14% of females with a horizontal septum (among 63.15% males and 54.95% of females). All the observations on nose have an insignificant difference between the sexes. The nasal index which is the ratio of nasal breadth multiplied by 100 and divided by its nasal height shows a highest percentage of males i.e. 49.51% having platyrrhine nose and 64.86% of females have mesorrhine nose (Table 5).

The difference in the prevalence of nasal index between the sexes is at an insignificant level. The Santhals of Dumka have thick lips, which has a marked eversion in

both the sexes. But the variation between the sexes is insignificant. Facial prognathism is medium (72.63% males and 63.06% females) (Table 1). There is a marked alveolar prognathism in 57.89% males and 47.74% females. Medium malar prominence is in highest percentage in 37.89% males and 36.03% females. All the variations in alveolar, facial and malar prognathism are at an insignificant level. Total facial index or morphological facial index, which is the ratio of morphological facial height multiplied by 100 divided by its bizygomatic breadth are presented in Table 5. They have a euryprosopic face (facial index 79-83.9). Maximum percentage of males (83.50%) and females (89.19%) have a euryprosopic face (Table 5). But they are at an insignificant level.

The descriptive statistics of anthropometric characteristics of the non-elderly Santhal males and females are presented in Table 4. It could be seen that the Santhal males have a short stature as per Martin classification.⁶ Males have an average height of 159.67 cms and females are of lower medium height with an average height of 150.45 cms. Sexual difference between the sexes in stature is statistically significant at the level of 5%. Sexual variation in almost all the measurements are statistically significant except in case of girth of thorax and girth of bicep. They have a significantly different body weight as well. The cephalic index which is the ratio of the maximum breadth (biparietal diameter) of the head multiplied by 100 divided by its maximum length (occipitofrontal diameter), is of hyper dolichocephalic type (Table 5). More than 50% of males and females have the cephalic index less than 70.9

DISCUSSION

It could be seen that the skin colour of the Santhals of Dumka is predominantly dark brown. The variations found in the skin colour between the sexes is statistically insignificant at the level of 5%. The part of the skin on the inner surface of the upper arm was observed and it has been compared to the standard colour scale, the Luschan's skin color chart.¹¹

The hair colour in highest frequency among them is black. It was determined on the basis of Fischer-Saller Scale. Intersexual variation in hair colour is insignificant. Hair form is broad wavy which is coarse and medium in quantity, again varying insignificantly between sexes at 5% level.

Racially Santhals are Austro Asiatic.¹² Guha et al in his classification has said the Santhals possess a dolichocephalic head, markedly platyrrhine nose, depressed at the root, short stature, dark brown skin colour, wavy or even curly hair. The limbs are delicate. Their forehead is less developed and slightly retreating. Supraorbital ridges are often prominent. They differ from Negritos in having wavy hair instead of frizzly or woolly of the latter. Bodding et al observed frizzly hair among some of the Santhal and their physical characteristics in general have doubled the existence of a Negroid element among them. In the present study, the Santhals of Dumka conformed to features of Guha's classification.¹⁴

The Santhals of the present study had an oblique downward axis of their eyes in highest frequency. Though the other types i.e. straight and upward oblique axis was also present among them. The sexual variation found in the types of palpebral opening is statistically significant. The presence of trace medium and marked epicanthic fold among the sexes is also significant. Their eye colour was dark brown with iris being rayed and sclera speckled. So, the presence of Austro-Asiatic elements is predominant in Dumka. The presence of massive supraorbital ridges and

broad forehead among both the sexes was quite prominent.

The nose is a person's most defining feature because of its location. They have a deep nasal depression and a concavo-convex nasal bridge. The nasal index found among the males in highest frequency is platyrrhine and the females have a mesorrhine nose in highest frequency. This difference though is insignificant. Mesorrhine nose was also been found among the Santhals of Bankura district, West Bengal.¹⁵ Santhal are been found not only in India but also in Bangladesh. In a study done among the Santhal of Rangpur and Dinajpur districts in Bangladesh, the nasal index was found to be 80.0.¹⁶ Therefore, they were also of mesorrhine type. Broad nose is always associated with hot and moist climate, so the Santhal of the present study may be were showing an adaptive strategy of survival in the climatic conditions of Jharkhand. The place had a hot and humid climate, so broad nose will definitely prove to be advantageous for them. They have thick lips with a marked eversion in both the sexes. Alveolar prognathism is marked but facial and malar prominence is medium. The Santhals of Dumka have basically a euryprosopic face.

From the anthropometric measurements, it could be seen that the non-elderly Santhal males are short statured (159.67 cms) and the females are of lower medium height (150.45 cms) as per Martin's classification. This difference between the sexes is statistically significant at the level of 5%. Their head is hyper-dolichocephalic. All the anthropometric parameters studied show a significant difference between the sexes, except girth of thorax and girth of bicep. Santhal of Birbhum in West Bengal are also of similar height (160.95 cms among the males are 150.46cms among the females).¹⁷ The Santhals of Bankura, West Bengal have the mean stature of 159.84 cms for the males and 148.94 cms for the females.¹⁵ So, the Santhals of Jharkhand and West Bengal are almost similar in their body dimensions.

CONCLUSION

Santhals of the present study therefore showed all the characters of Austro-Asiatic classification. A typical Santhal of Dumka, Jharkhand is of short stature, have a hyperdolichocephalic head, mesorrhine nose and euryprosopic face. Jharkhand has a hot and humid climate. The nasal index maybe is an adaptive strategy of survival on the part of males having platyrrhine nose and female having mesorrhine nose. They have dark brown skin colour. Hairs are coarse, broad wavy and black in colour, which are medium in quantity. Their eyes dark brown in colour has a marked epicanthic fold. The supraorbital ridges are continuous with a broad forehead. They have a medium facial prognathism with thick lips. The Santhals of Dumka are therefore a well-adapted population of the region showing significant sexual variations in some of the traits and insignificant differences in many.

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