

A Note on Age Changes in Anthropometric Characters among the Tea Garden Labourers of Northern West Bengal

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Abstract : Anthropometric measurements were taken on 477 adult (both male and female) Oraon tea garden labourers of Birpara and Dalgaon tea gardens of northern West Bengal. The objective was to detect the starting point as well as the nature and extent of regressive changes of different body measurements in this population. The result shows that the age-wise decrease of anthropometric measurements (a) generally start at the 20-29 years age group, and (b) males have a more clear pattern than females.

INTRODUCTION

Individuals experience great changes from childhood to old age in respect of bio-medical traits. In respect of body dimensions, although it may intuitively appear that once the body reached its adult size, all its dimensions would remain stable for many years to come, actually there is no period of life without change (Pokopec 1987). Most of the human bio-medical characteristics exhibit "progressive" changes in the younger and "regressive" ones in old ages. The latter are not a reversal of the previous conditions, but constitute emergence of new qualities; hence they also represent development, but a regressive development (Wolanski and Pyzuk 1972). Many studies have been devoted to progressive development (Eveleth and Tanner 1976; Johnston *et al.* 1976 and Malina 1978) but only a few to regressive changes (Susanne 1980; Sidhu *et al.* 1983; Rosenbaum *et al.* 1985).

It is, therefore important to enquire, at what age the regression of various body measurements start and what are the nature and extent of regression in respect of different body measurements in specific ethnic groups inhabiting given physical and socio-economic environmental niches.

MATERIALS AND METHODS

Data were collected as a part of an ongoing project on 477 adult (20 years and above) tea garden labourers -367 males and 110 females - belonging to the Oraon tribe from the tea gardens of Birpara and Dalgaon in the Jalpaiguri district of northern West Bengal.

The Oraons are a Dravidian - speaking population and are supposed by some to be indigenous to southern India (Dalton 1982), but are known to inhabit the Chotanagpur plateau in Bihar for centuries. Anthropometric measurements were made on the Oraon tea garden labourers of both the tea gardens located in the foothill region of northern West Bengal. This group is believed to have migrated to their present habitat about the end of the last century (Choudhury 1978).

The tea gardens are situated in the north eastern part of the Jalpaiguri district which forms the foothill belt of the Himalaya where the elevation gradually increases from the alluvial plain to about 2,000 metres and above. Owing to proximity to the hills, the rainfall is heavy (3,295.1 mm/year) and the temperature is fairly high (max. 31.6°C, min. 21.3°C). The atmosphere is highly humid throughout the year. Usually tea garden authorities engage both adult members of a simple family (consisting of husband, wife and their unmarried children) in the garden work and each individual labourer gets an average monthly payment of Rs.300.00 plus food grains at subsidized rates. Beside these they are also provided with free housing, piped water, free medical

Table 1. *Anthropometric measurements by age group (Male)*

GROUP	Height			Sitting height			Biacromial Diameter			Iliiac Diameter			Weight		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
	140	162.85	5.70	140	83.60	3.08	140	36.38	1.83	140	26.10	1.23	140	48.21	5.06
89	161.99	6.78	89	83.06	3.67	89	36.18	1.76	89	26.19	1.21	89	47.84	5.21	
72	158.75	5.49	72	81.19	3.06	72	35.31	1.68	72	26.00	1.26	72	45.90	4.77	
44	158.38	6.06	44	80.83	3.47	44	35.33	1.77	44	26.01	1.38	44	44.89	5.75	
22	157.73	5.11	22	79.23	2.46	22	34.69	1.63	22	25.75	1.12	22	42.79	5.10	

GROUP	Biceps Girth			Calf Girth			Chest Girth (Inh.)			Chest Girth (Exh.)			Subscapular Skinfold		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
	140	23.60	1.67	139	29.99	1.68	140	83.57	3.70	140	81.07	3.72	140	8.49	2.13
89	23.40	1.74	89	29.40	1.87	89	84.08	3.39	89	81.83	3.39	89	8.74	2.95	
72	23.35	1.62	72	28.75	1.80	72	82.91	3.55	72	80.74	3.41	72	8.55	2.30	
44	22.76	1.64	44	28.35	1.82	44	81.84	4.30	44	79.50	4.19	44	8.49	2.43	
22	22.32	2.48	22	27.60	1.77	22	81.20	4.17	22	79.14	3.96	22	8.01	3.25	

Table 2. Anthropometric measurements by age groups (Female)

AGE GROUP (Yrs.)	Height			Sitting height			Biacromial Diameter			Biliac Diameter			Weight		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
	20-29	55	150.45	5.02	55	76.58	2.95	55	32.55	1.47	55	25.39	1.34	55	40.96
30-39	10	147.56	4.91	10	76.12	2.19	10	31.60	1.60	10	26.13	1.02	10	39.35	3.57
40-49	26	145.53	6.56	26	74.16	2.94	26	30.96	1.44	26	24.83	1.10	26	34.75	5.44
50-59	14	144.30	6.16	14	73.80	3.07	14	31.12	1.84	14	25.46	1.30	14	34.82	3.08
60+	5	147.14	5.75	5	73.82	3.38	5	31.28	0.92	5	25.70	1.11	5	33.60	3.65

AGE GROUP (Yrs.)	Biceps Girth			Calf Girth			Chest Girth (Inh.)			Chest Girth (Exh.)			Subscapular Skinfold		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
	20-29	55	21.37	2.15	55	27.05	2.08	55	76.92	3.95	55	75.02	4.08	55	10.34
30-39	10	21.03	1.37	10	26.50	1.49	10	74.24	1.20	10	72.22	1.42	10	9.54	2.39
40-49	26	20.03	2.34	26	25.43	1.85	26	72.60	3.80	26	70.88	3.66	26	9.21	3.74
50-59	14	20.22	1.45	14	25.75	1.92	14	72.41	2.74	14	70.54	2.66	14	8.96	2.62
60+	5	20.14	2.34	5	25.66	2.07	5	72.18	5.10	5	70.24	5.47	5	8.52	2.87

facilities for family members and education facilities for the children upto the primary level).

The result of the present study are based on cross-sectional data; anthropometric measurements were taken using standard instruments and techniques (Weiner and Lourie 1981). The data have been divided into five - 10 yearly age groups.

RESULTS AND DISCUSSION

Male

The mean values of height, sitting height, biacromial diameter, weight, biceps girth and calf girth show a gradual decrease with advancing age from the age group 20-29 to 60+ years (Table 1). But, in case of chest girth measurements (both inhalation and exhalation) and subscapular skinfold thickness, the mean value increases from 20-29 to 30-39 and then decreases to 60+ years. In general, there is an inverse relationship of anthropometric measurements with age.

Females

Among females, the trend of age-wise decrease is not as clear as among males. The highest mean value occurs in the 20-29 years age group in all the measurements (i.e., height, sitting height, biacromial diameter, weight, biceps girth, calf girth, chest girth (inhalation and exhalation) and subscapular skinfold thickness, except biiliac diameter; in case of the latter the highest value occurs in the 30-39 years age group (Table 2). Both chest girth measurements and subscapular skinfold thickness show a gradual decrease of mean values with advancing age from 30-39 age group. An overall pattern of decrease with advancing age, however, appears to exist among the females as well with a few exceptions.

Thus, the results of the present study corroborates the findings of Susanne (1977), Frisancho (1976) and others regarding the age-wise decrease of anthropometric measurements among adults, but is also shows that the pattern is more clear in males than in females. This may simply be a function of small number of observations in individual age groups in the latter, or alternatively to the operation of differential effects of some intervening factors in the two sexes.

REFERENCES

- Choudhury, M. R. 1987. *The Tea Industry in India : A Diagnostic Analysis of its Geoeconomic Studies*. Oxford Book and Stationary Company, Calcutta.
- Dalton, E. T. 1982. *Descriptive Ethnology of Bengal*. Government of Bengal, Reprint 1960 by Indian Studies : Past and Present. Firma K. L. M., Calcutta.
- Eveleth, P. B. and J. M. Tanner 1976. *Worldwide Variation in Human Growth*. Cambridge University Press, London.
- Frisancho, A. R. 1976. Growth and morphology at high altitude. In : *Man in the Andes : A Multidisciplinary Study of High-Altitude Quechua*, ed. by P. T. Baker and M. A. Little. US/IBP Synthesis series I, Pennsylvania : Dowden, Hutchinson and Ross, Inc.
- Johnston, F. E., H. Weiner, D. Thissen and R. B. Macvean 1976. Hereditary and environmental determinants of growth in height in a longitudinal sample of children and growth of Guatemalan and European ancestry. *American Journal of Physical Anthropology* 44:469-476.
- Malina, R. M. 1978. Adolescent growth and maturation : Selected aspects of current research. *Year book of Physical Anthropology* 21 : 63-94.
- Prokopec, M. 1987. Changing patterns of growth, development and ageing in the population of Czechoslovakia. *Collegium Anthropologicum* 11 : 91-115.
- Fosenbaum, S., R. K., Skinner, I. B. Knight, and J. S. Garrow 1985. A survey of heights and weights of adults in Great Britain 1980. *Annals of Human Biology* 12 : 115-128.
- Sidhu, L. S., P. Singal and D. K. Kansal 1983. Processes of maturation and senescence in two communities of Punjab (India) as studied from some morphological measures. *Anthropologischer Anzeiger* 41 : 149-159.
- Susanne, C. 1977. Individual age changes of the morphological characteristics. *Journal of Human Evolution* 6 : 181-189.

- Susanne, C. 1980. Ageing, continuous changes of adulthood. In : *Human Physical Growth and Maturation : Methodologies and Factors*, ed. by F. E. Johnston, A. F. Roche and C. Susanne. Plenum Press. New York.
- Weiner, J. S. and J. A. Laurie 1981. *Practical Human Biology*, Academic Press. London.
- Wolanski, N. and M. Pyzuk 1972. Morpho-physiological characters and physical working capacity in 15-72 years old inhabitants of low mountains, Lientny Range, Poland. *Human Biology* 44 : 595-612.

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