

Cephalo-facial Growth in the Chenchu Tribal Girls of Andhra Pradesh

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ABSTRACT The cross-sectional study was undertaken in schools situated in the Pedda Dornala mandal of Prakasam and Atmakoor mandal of Kurnool districts of Andhra Pradesh during December 1992 to January 1993. The sample consisted of 286 healthy Chenchu girls aged '0' through 18 years. The analysis of the data reveal that all head and face measurements attain adolescent growth spurt between 12 and 16 years. All these measurements increase upto 16 years then gradually declined.

Growth trends generally do not vary under normal conditions of nutrition but to a major extent depends upon the socio-economic status of an individual. Many researchers have tried to enumerate the trends of growth under different situations all over the world, but little attention has been paid on tribal populations. In present study an attempt has been made to study the patterns of growth of tribal children, who belong to lower socio-economic strata having poor nutritional condition. Several studies of physical growth of cephalo facial dimensions have been showed gradual increase in mean values with advancing age (Goldstein, 1932; Shuttle Worth, 1939; Tanner, 1962; Singhrol and Mitra, 1985). But little attention has been paid towards food gathering Chenchu tribal girls.

The present study deals with six anthropometric measurements which are studied to evaluate the effect of age from '0' through 18 years on their growth patterns and also to compare with other populations to find out the population difference of cephalo and facial dimensional growth.

MATERIAL AND METHODS

The Chenchus a food gathering tribe is predominantly found in Nallamalai hills which

are a part of Eastern Ghats. They are spread over in six districts *i.e.* Prakasam, Kurnool, Guntur, Mahaboob Nagar, Nalgonda and Ranga Reddy districts of Andhra Pradesh. As these hills are abundant with flora and fauna, the Chenchus are subsisting on food gathering and hunting of wild animals. The Chenchus are divided into 4 endogamous sub-divisions.

i) *Adavi Chenchus* : They are traditionally forest dwellers, and hence the name Adavi Chenchus,

ii) *Deva Chenchus*: They are engaged as temple servants,

iii) *Bontha Chenchus*: They named after 'Bontha' meaning a piece made up of an old cloth and rags tied around the waist of women folk. These Bontha Chenchus make household articles, ladders etc. with bamboo,

iv) *Krishna Chenchus*: They are nomadic mendicants mainly subsist on begging. They are also called as Dasari Chenchus.

Of these 4 groups, only Adavi Chenchus and Deva Chenchus constituting more than 60% of the total Chenchu population found in ITDA area while the remaining two groups namely Bontha Chenchus and Krishna Chenchus account 40% to total Chenchu population, are spread over in plain areas.

The social structure, clan organisation, customs and traditions of Adavi Chenchus and

Deva Chenchus are identified and inter group marriages are socially accepted.

The important pilgrim centres like Srisailem, Mahanandi and Ahobilam of Kurnool district are situated in traditional habitats of Chenchus, and the Chenchus are assigned with special roles in these temples rituals. Most of the Chenchu families are nuclear type. One of the characteristic feature of the Chenchu society is establishing a separate family by son, immediately after his marriage. Child marriages are very common among the Chenchus.

Most of the Chenchus live in small conical shaped huts. However, rectangular, oblong and square type houses also exist. The Chenchus share their residence along with their goats, sheep and cattle by keeping them inside the house. Thus the Chenchu houses looks dirty and unclean and due to this, the Chenchus suffer from scabies and other skin diseases.

The Chenchu settlement patterns are called as Chenchugudems. These gudems are spread all over the Nallamalai hills. Lambadas also live with the Chenchus in some gudems.

The most important food items that are consumed by the Chenchus are roots and tubers, leafy vegetables, vegetables, fruits, seeds and nuts, mushrooms, flesh foods and the agricultural foods like Jowar, Bajra and rice etc. Data were collected, cross-sectionally on 286 Chenchu girls aged '0' to 18 years drawn from 9 schools of Pedda Dornala mandal of Prakasam district and 3 schools of Atmakoor mandal of Kurnool district during the months of December 1992 to January 1993. The ages of these subjects range from '0' to 18 years. Considerable difficulty has always been encountered in obtaining correct age of Indian children and more so of tribal children. Considerable care has been taken for minimising errors in estimating the dates of birth, since correct age is extremely important in growth studies. Dates of birth of the subjects are derived from birth certificates which are required for admission into the schools. In this

field area local primary school teachers have been given the task of maintaining birth and death registers of their villages and some times of nearby villages as well. They submit these records every year to the respective panchayat offices. Parents are expected to produce birth certificates when they admit their children in schools, especially at the primary level. The doubtful cases were excluded from the present sample. The age of each individual was calculated to three decimal places after Tanner et al. (1966). For example, age group '0' included all the subjects from birth day to 0.499, age group '1' from 0.500 to 1.499 and age group 2 from 1.500 to 2.499 and so on. The measurements on individual were taken during the working hours of the school. The measurements — head length, head breadth, morphological facial height, bizygomatic diameter, nasal height and nasal breadth were taken after Weiner and Lourie (1969). The measurements were taken by the first Author.

The source of error (Knott, 1941) are accidental or technical. Accidental errors include incorrect reading of the instrument and incorrect recording. The two errors were minimised by careful practice in the laboratory before actually undertaking the field work and by using a trained assistant for recording the measurements on schedule. Both procedures were observed here. The major technical errors generally committed are (1) the faulty location of the landmarks, (2) incorrect position of the subject, (3) faulty application of instruments utilised and (4) different amounts of pressure created while taking measurements. In the present study the author has strived to minimise the errors. It would be a rather naive to claim absolute accuracy, but all efforts were made to minimize the errors as much as possible.

The whole year mean increments have been calculated by subtracting the mean of the preceeding age group from that of the succeeding age group. Growth velocity is increment per unit time of a measurement that is constantly growing and the concept is well understood if

Table 1: Mean, standard deviation of head and face anthropometric variables among Chenchu tribal girls of Andhra Pradesh

Age (in years)	N	Head length		Head breadth		Bizygomatic diameter		Morphological facial height		Nasal height		Nasal breadth	
		$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
0	6	12.10	0.89	9.96	0.19	7.46	0.47	5.83	1.00	2.31	0.22	2.03	0.05
1	13	14.62	1.23	11.29	0.55	8.34	0.47	6.76	0.43	2.70	0.26	2.43	0.16
2	10	15.33	0.42	11.97	0.46	8.77	0.63	7.48	0.66	3.01	0.29	2.59	0.15
3	10	15.70	0.48	11.82	0.28	9.05	0.48	7.71	0.56	3.07	0.19	2.63	0.17
4	15	15.72	0.53	12.16	1.26	9.46	0.90	7.57	0.36	3.13	0.17	2.61	0.19
5	16	16.16	0.35	12.31	0.43	9.56	0.51	8.05	0.56	3.26	0.23	2.82	0.25
6	26	16.19	0.47	12.28	0.61	9.73	0.66	8.57	0.75	3.43	0.30	2.87	0.27
7	28	16.12	0.65	12.42	0.54	9.88	0.71	8.36	0.41	3.40	0.32	2.85	0.19
8	30	16.41	0.56	12.43	0.55	10.29	0.69	8.72	0.43	3.56	0.34	2.97	0.25
9	19	16.80	0.45	12.73	0.54	10.32	0.54	8.73	0.47	3.65	0.31	3.06	0.26
10	13	16.66	0.42	12.54	0.39	10.37	0.46	8.77	0.48	3.64	0.33	2.99	0.13
11	10	16.72	0.44	12.85	0.40	10.60	0.46	9.17	0.42	3.85	0.37	3.19	0.15
12	11	16.90	0.47	12.58	0.52	10.69	0.39	8.79	0.68	3.79	0.35	3.19	0.29
13	10	17.01	0.42	12.79	0.36	11.26	0.62	9.49	0.65	4.16	0.47	3.35	0.39
14	10	16.81	0.71	12.53	0.55	11.14	0.84	9.56	0.45	3.99	0.24	3.10	0.15
15	10	17.01	0.77	12.71	0.63	11.08	0.47	9.58	0.59	3.69	0.35	3.22	0.19
16	10	17.30	0.45	13.02	0.47	11.56	0.52	9.69	0.36	3.98	0.37	3.29	0.29
17	10	17.48	0.72	13.13	0.57	11.54	0.65	9.79	0.32	4.15	0.33	3.29	0.13
18 & above	29	17.44	0.56	13.13	0.40	11.33	0.94	9.65	0.58	3.88	0.25	3.29	0.25

growth is thought of as a form of motion (Tanner, 1964). The values for a growth velocity of a measurement are easily obtained by subtracting for that variable, say at age 'A' from its mean value at age (A+1 year) is as below:

$$\text{Velocity (V)} = \bar{X} (A+1) - \bar{X} A$$

According to Thompson (1942) plotting their successive differences against time, we obtain a curve each point one which represents a certain rate at a certain time....this shows a succession of varying velocities. The Mathematicians call it a 'curve' of first difference. Some one call it a curve of annual increments, but nothing wrong, if we call it a curve of the rate of growth or simply a velocity curve.

RESULTS AND DISCUSSION

Mean values, standard deviations for all measurements have been depicted in table 1.

It can be inferred from the table that all measurements show gradual increase in mean values with advancing age with a few fluctuating discrepancies of a minor nature because the data are cross-sectional. The mean head length of infant at '0' group is 12.10 cm, it increases by 5.50 cm from '0' to 18 years. The mean head breadth at '0' group is 9.96 cm, it increases by 3 cm from '0' to 18 years. The mean morphological facial height at '0' group is 5.83 cm, it increases by 4 cm between '0' through 18 years. The mean bizygomatic diameter at '0' group is 7.46 cm, it increases by 4 cm. from '0' to 18 years. The mean nasal height and nasal breadth at '0' group is 2 cm, it increases by 2 cm and 1 cm, respectively at the end of 18 years (Table 1). The head length, head breadth, morphological facial height, bizygomatic diameter, nasal height and nasal breadth showed maximum growth rate between 1 and 2 years, and from 3 years of age the rate of growth declined. The juvenile spurt of head length (0.44), head breadth (0.15) and nasal breadth (0.21) was attained between 4 and 5 years which was earlier by a year than morphological facial height (0.52) and nasal height (0.17) and earlier by four years than bizygomatic diameter (0.41). The adolescent

growth spurt of head length and head breadth is observed between 15-16 years; and bizygomatic diameter, morphological facial height, nasal height and nasal breadth is earlier by three years (12-13 years) than the former group (Table 2).

Table 2 : Annual increments for six head and face anthropometric variables among Chenchu tribal girls of Andhra Pradesh

Age in years	Head length	Head breadth	Bizygomatic diameter	Morphological facial height	Nasal height	Nasal breadth
1	2.52	1.33	0.88	0.93	0.39	0.40
2	0.71	0.68	0.43	0.72	0.31	0.16
3	0.37	-0.15	0.28	0.23	0.06	0.04
4	0.02	0.34	0.41	-0.14	0.06	-0.02
5	0.44	0.15	0.10	0.48	0.13	0.21
6	0.03	-0.03	0.17	0.52	0.17	0.05
7	-0.07	0.14	0.15	-0.21	-0.03	-0.02
8	0.29	0.01	0.41	0.36	0.16	0.12
9	0.39	0.30	0.03	0.01	0.09	0.09
10	-0.14	-0.19	0.05	0.04	0.01	-0.07
11	0.06	0.31	0.23	0.40	0.21	0.20
12	0.18	-0.27	0.09	-0.38	-0.06	0.00
13	0.11	0.21	0.57	0.70	0.37	0.16
14	-0.20	-0.26	-0.12	0.07	-0.17	-0.25
15	0.20	0.18	-0.06	0.02	-0.30	0.12
16	0.29	0.31	0.48	0.11	0.29	0.07
17	0.18	0.11	-0.02	0.50	0.17	0.00
18 & above	-0.04	0.00	-0.21	-0.24	-0.27	0.00

It will be apparent from the foregoing results that the finding among Chenchu tribal girls were more or less similar to the findings of Goldstein (1939), and Shuttleworth (1939), Tanner (1962), Singhrol and Mitra (1985).

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