

BRIEF COMMUNICATIONS

Growth Patterns and Maturity Gradients of Bicondylar Femur and Wrist Breadth Among Yadava and Vadabalija Girls of North Coastal Andhra Pradesh, India—A Comparative Study

B. Dharma Rao and B.R. Busi

Department of Anthropology, Andhra University, Waltair 530 003, Andhra Pradesh, India

KEY WORDS Bicondylar Femur. Wrist Breadth. Yadava. Vadabalija. Andhra Pradesh.

ABSTRACT The present study, based on a cross-sectional sample of 632 Yadava and 608 Vadabalija female children in the age range of 1 to 20 years, confines to the development-cum-maturational trends and evaluation of growth differences among Yadava and Vadabalija girls with the help of two anthropometric measurements. Analysis of the data reveal that all measurements show significant differences in some age groups among Yadava *versus* Vadabalija girls. It can be inferred that the differential growth patterns observed between these two groups may be due to genetic factor associated with socio-economic environment.

The present study deals with two anthropometric variables which are studied to show the effect of age from 1 through 20 years on growth patterns and developmental-cum-maturational direction; and also to study growth differences among rural, and agricultural Yadava and fishing Vadabalija girls.

breadth were taken after Weiner and Lourie (1969).

RESULTS AND DISCUSSION

Mean and standard deviation values of two anthropometric variables among Yadava and Vadabalija girls have been depicted in table 1. It can be concluded from the table that the mean values of these variables increase with increase in age. The mean bicondylar femur of infants at 1 year was about 3 cm. It increased one and half times by 5 years. An increment of 2.5 cm was noticed from 6 to 20 years in both the groups. The mean wrist breadth of infants at 1 year was 2 cm, it doubled by 11 years, and then an increment of 2.5 cm was observed from 12 to 20 years in both the groups. These measurements showed maximum annual increments between 1 and 2 years, as from 3 years the annual increments declined in both the groups. The adolescent growth spurt of bicondylar femur and wrist breadth was attained between 11 and 12 years in both the groups. The wrist breadth showed minimum

MATERIAL AND METHODS

The Yadava (Golla) of North Coastal Andhra region is traditionally a pastoral community occasionally engaged in farming. Vadabalija is one of the nine important fishing communities found in the North-East Coastal tract of Andhra Pradesh. Data were collected, cross-sectionally, on 632 Yadava and 608 Vadabalija girls, aged 1 to 20 years, from 23 villages of Bheemunipatnam and Anandapuram mandals of Visakhapatnam District of Andhra Pradesh during January, 1986 to June, 1987. The age of each individual was calculated to three decimal places after Tanner et al. (1966). The measurements of bicondylar femur and wrist

Table 1: Comparison of two anthropometric variables and maturity gradients among Yadava and Vadaballija girls

N	Yadava				Age Group in Years	Vadaballija				t-test comparison						
	Bicondylar Femur		Wrist Breadth			Bicondylar Femur		Wrist Breadth		Gradient	Bicondylar Femur	Wrist Breadth				
	$\bar{X}$	SD	Gradient	$\bar{X}$		SD	Gradient	$\bar{X}$	SD							
50	3.26	0.60	47.04	2.28	0.33	49.35	1	57	3.32	0.56	47.36	2.17	0.27	47.38	0.53	1.87
40	3.66	0.47	52.81	2.42	0.23	52.38	2	41	3.82	0.52	54.49	2.35	0.21	51.31	1.45	1.43
36	4.04	0.43	58.30	2.53	0.17	54.76	3	40	4.26	0.31	60.77	2.46	0.22	53.71	2.53 ²	1.56
40	4.37	0.36	63.06	2.62	0.24	56.70	4	35	4.45	0.37	63.48	2.59	0.27	56.55	0.95	0.51
60	4.52	0.37	65.22	2.95	0.24	63.85	5	42	4.67	0.45	66.61	2.84	0.29	62.00	1.78	2.02 ¹
47	4.62	0.48	66.67	3.10	0.27	67.09	6	42	4.80	0.39	68.47	3.04	0.28	66.37	1.95	1.03
47	4.87	0.43	70.27	3.33	0.25	72.08	7	35	4.94	0.48	70.47	3.18	0.24	69.43	0.68	2.75 ³
44	5.11	0.50	73.74	3.45	0.30	74.68	8	37	5.24	0.51	74.75	3.37	0.28	73.58	1.15	1.24
34	5.33	0.50	76.91	3.66	0.17	79.22	9	39	5.55	0.35	79.17	3.63	0.24	79.26	2.15 ¹	0.62
27	5.45	0.46	78.64	3.80	0.24	82.25	10	34	5.71	0.58	81.45	3.77	0.31	82.31	1.95	0.43
27	5.65	0.54	81.53	3.92	0.24	84.85	11	30	5.85	0.46	83.45	3.88	0.29	84.71	1.50	0.57
21	6.04	0.85	87.16	4.18	0.25	90.48	12	30	6.14	0.59	87.59	4.09	0.30	89.30	0.47	1.16
35	6.19	0.46	89.32	4.29	0.18	92.86	13	29	6.42	0.53	91.58	4.22	0.23	92.14	1.83	1.33
18	6.41	0.57	92.50	4.40	0.21	95.24	14	25	6.52	0.56	93.00	4.30	0.22	93.89	0.63	1.51
28	6.56	0.46	94.66	4.51	0.18	97.61	15	21	6.70	0.58	95.58	4.45	0.25	97.16	0.91	0.93
20	6.71	0.59	96.82	4.58	0.18	99.13	16	19	6.87	0.57	98.00	4.50	0.19	98.25	0.86	1.35
21	6.82	0.27	98.41	4.60	0.26	99.57	17	13	6.98	0.40	99.57	4.54	0.30	99.12	1.27	0.70
11	6.89	0.45	99.42	4.62	0.23	100.00	18	14	7.01	0.43	100.00	4.58	0.30	100.00	0.67	0.38
13	6.93	0.21	100.00	4.62	0.20	100.00	19	13	7.01	0.40	100.00	4.58	0.24	100.00	0.64	0.46
13	6.93	0.20	—	4.62	0.39	—	20	12	7.01	0.52	—	4.58	0.28	—	0.50	0.30

1. Significant at 5% level; 2. Significant at 1% level; 3. Significant at 0.1% level

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maturity at 1 year and maximum at 18 years in both the groups, whereas the bicondylar femur of Yadava girls was delayed by one year when compared to Vadabaliya girls. The wrist breadth of Yadava girls matured earlier than bicondylar femur of same group which is visibly suggestive of the cephalocaudal gradient of growth. On the other hand bicondylar femur and wrist breadth of Vadabaliya girls matured at the same time (18 years). When comparing the Yadava and Vadabaliya girls age-wise from 1 to 20 years for bicondylar femur and wrist breadth, statistically significant differences were observed in some age groups *i.e.*, for bicondylar femur (3 and 9 years) and wrist breadth (5 and 7 years). The bicondylar femur and wrist breadth of Yadava and Vadabaliya girls were however distinctly less than Rajput girls and Brahmin girls (4 to 15 years) of Chamba district, Himachal Pradesh (Singal *et al.*, 1990).

The growth differences observed between the Yadava and Vadabaliya girls need to be explained at this juncture. The social status of both the caste groups in the prevailing Hindu caste system is low. The Vadabaliya community in particular is very poor, their occupation (fishing) is not as dignified as that of the Yadavas (agriculturists), they occupy a low position in the society, live mostly outside the villages, and are educationally backward. Both the groups are of lower income groups. The factors associated with socio-economic environment may play a role in limiting growth potential throughout the growth period. The socio-economic status of the Yadava community is considerably better than the Vadabaliya. However, owing to the occupation it is obvious that Vadabalijas have easy access to and may consume fish and other sea foods abundantly as also shown by other studies (Busi *et al.*, 1987).

This high consumption of protein rich food of Vadabalijas may have resulted in better growth.

Regarding the genetic differences, both Yadava and Vadabaliya are reproductively isolated from one another and also strictly endogamous. Raja Rajeswari (1988) in her study observed some differences between these two communities in their demographic, genetic and other characters. These inherent genetic factors affecting the velocity of growth which give the Vadabaliya girls a characteristic cross-sectional growth patterns in these variables which is quantitatively different from that observed in Yadava girls. This would be consistent with what is known of genetic factors affecting growth and development (Tanner, 1962) and comparative growth studies of different ethnic groups (Eveleth and Tanner, 1976).

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