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A study of growth patterns of selected anthropometric Variables of Delhi rural population

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Abstract
The present research study is based on cross-sectional data of 389 Jat boys ranging in age from 10 to 20 years. The sample of 389 subjects belonged to a single endogamous genetic group of Jat boys of Delhi (rural area). They all were residing in Delhi of rural areas. For the paper, only two anthropometric variables i.e. weight and height were taken. In such cross sectional data, the age was distributed continuously, some method of age grouping has to be followed. So in order to bunch the subjects into age classes during this phase of growth i.e. from 10 to 20 years, are generally made. The data were grouped into eleven age groups (10 to 20yrs). Descriptive statistical calculation was used for tabulation work. The mean, Standard Error of Mean (S.E.M), Standard Deviation (S.D.) and velocity (V) was used to present the data. The figures to indicate the velocity and distance curve were used. These tabulation work and figures depict the growth patterns of Jat boys in tables. Age wise of 11 groups were made to view the kin anthropometric variables to show the relationship. The tabulation work shows the growth patterns in line with physiology and anatomy.

Keywords: Cross-sectional, anthropometric, distance curve, velocity curve, growth patterns, endogamous, Delhi Jat boys, weight, height

Introduction
In today's scientific world sports achievements have been greatly influenced by research in sports science. Study on relation of kin anthropometric aspects to sports talent identification and later to better performance in sports draw attention to include body of knowledge disseminated from research studies carried till now and continued further. A systematic screening for the sport talent may be developed in order to enable each children to participate some suitable physical activity to look and feel better but also to develop bodies capable of some type of productive performance (Hazeldin, 1987) [9].

In the anthropometric area, the credit of the first complete and systematic study goes to Belgian astronomer (Quetlot, 1869), also considered the term Anthropology and published the data, height and weight measurement of male and female subjects of all ages in 1835. It was the only toward the end of nineteenth century that most of the significant growth studies on child growth were conducted by subsequent researchers like (Boas, 1895, 1932, 1940) [1-3]; (Devenport, 1930, 1932). These studies contributed a great deal to the understanding of such growth processes as the adolescent spurt, parental child similarities in body build secular trends and patterns of growth. According to Garn (1952) [7], growth refers mainly to change in magnitude, increment in size of the organs increase in thickness of tissues or changes in the size of individuals.

In order to keep the pace with the global trends, it is very important for India to follow scientific methods for spotting out talent at young age itself. In India unfortunately, it is not given proper attention so, the athletes are selected from the available "available pool" mainly on the basis of their performance in various sports meets and tournaments. According to Debnath (1994) [6], it is essential to collect the data on the morphological and physiological responses of the participants to general tasks and during participation in different sports.

Lack of authentic study for the Indian population, as a basis for appraising the health status of children, was recognized by the Indian council of medical research so consequently the various studies like cross sectional, were undertaken. ICMR (1972) [10] has conducted a wide spread

survey in the country in growth of children and presented norms and standards. Ghai (1979) [8], reported in its findings on the physical growth and development of Himachal Pardesh female between 6 to 17 years. Singal (1979) [14] carried out on morphological age changes in girls Belonging to two communities of Punjab. Singh (1970) [15] studied growth patterns from 4 to 20 years of male from Rajput Gaddis. Kansal (1981) [11], reported the age changes in physique and body composition in male of two communities of Punjab. Keeping in view the above description, it may be evidently said that kin-anthropometric and sports performance measures during the adolescent period are very important areas to study in the field of kin-anthropometric variables.

Methodology

The present study is based on cross-sectional data of 389 boys approximately ranging in age from 10 to 20 years belonging to a single endogamous genetic group of Jat boys of Delhi (rural area), all residing in Delhi of rural areas. For this paper only two anthropometric variables i.e. weight and height were taken. Only healthy subjects, not suffering fem any type of disability, were included in the present study.

The population of Delhi includes higher percentage of Jat boys in rural area than that of other communities taken individually, therefore it was considered more benefitted to select Delhi Jat boys as the subject for the present study. Only Jat boys students belonging to 14 educational institutions from rural areas of North West district of Delhi were included in the present study. Maximum efforts were made to approximate random sampling as close as possible. The ages of the subjects were calculated up to three decimal places from the date of birth and date of examination by converting the days and months into the fractions of a year as illustrated by Tanner (1978) [16]. In this cross-sectional study, the data were grouped into eleven age groups (10 to 20 yrs) with an interval of one year between the successive groups. In such cross sectional data when the age is distributed continuously, some method of age grouping has to be followed in order to bunch the subjects into age classes during this phase of growth i.e. from 10 to 20 years, are generally made. The data were grouped into eleven age groups (10 to 20 yrs).

In the study, descriptive calculation was used for tabulation work. The mean, Standard Error of Mean (S.E.M), Standard Deviation (S.D.) and velocity (V) was used to present the data. The graph to indicate the velocity and distance curve was used. These tabulation work and graph depict the growth patterns of Jat boys in tables. Age wise of 11 groups were made to view the kin anthropometric variables to show the relationship. The presentation of tables and graphs show the growth patterns of Delhi Jat boys ranging in age from 10 to 20 yrs.

The classification of Jat boys of Delhi, measured anthropometrically into one year age group showing number of subjects has been given in table (1).

Table 1: Breaking of data according to age groups with their mean age and number of subjects in each group

Sr. No.	Age range	Age group	Mean age	N
1	9.501-10.500	10	09.95	41
2	10.501-11.500	11	11.13	35
3	11.501-12.500	12	11.97	34
4	12.401-13.500	13	12.93	36
5	13.501-14.500	14	13.99	38
6	14.501-15.500	15	14.86	37
7	15.501-16.500	16	15.99	35
8	16.501-17.500	17	17.03	37
9	17.501-18.500	18	18.03	35
10	18.501-19.500	19	18.91	31
11	19.501-20.500	20	19.87	30
No. of groups = 11			Total = 389	

Table 2: Mean, standard error of mean (S.E.M.), standard deviation (S.D.) and year velocity (V) of Delhi Jat boys from 10 to 20 years

Weight					
Age	**No.**	**Mean**	**S.E.M.**	**S.D**	**V**
10	41	28.05	0.83	5.31	
11	35	29.91	0.77	4.57	1.86
12	34	32.62	1.15	6.72	2.71
13	36	36.39	1.07	6.42	3.73
14	38	40.90	0.93	5.70	4.56
15	37	45.75	1.45	8.80	4.78
16	35	51.54	1.28	7.57	5.81
17	37	55.68	0.74	4.51	4.14
18	35	57.97	1.06	6.26	2.38
19	31	59.23	0.75	4.15	1.26
20	30	60.87	0.90	4.93	1.64

According to table (2), the mean of body weight at age of 10 years is 28.05 kg and at age of 20 years, it attains the value of 60,87 kg. From 10 to 20 years of age, body weight increases gradually with advancing age. The peak adolescent velocity has been observe is 5.8 kg per year been notice at the age of 15.5 years which is the adolescent peak growth a year; the of velocity falls to 4.14 kg per year at age of 16.5 years and 2.2 kg per year at age of 17.5 year followed by 1.6 kg at age of 19.5 years. Total body weight gained in a span of 11 years is 32.82 kg, as evident from table 2 and fig. (1 & 2).

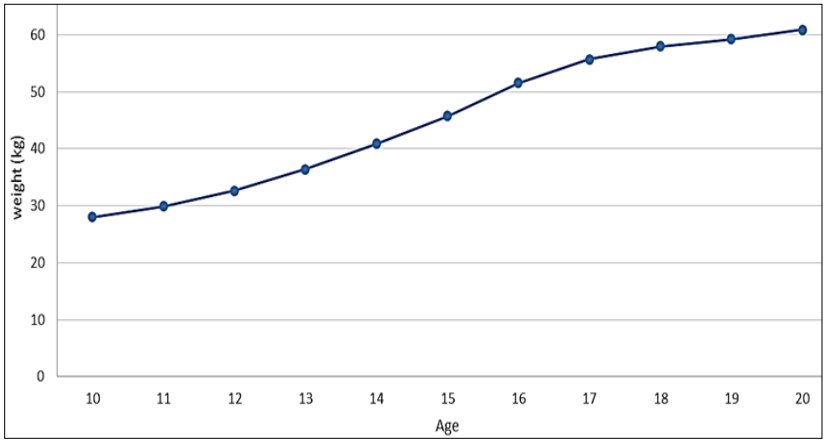

Fig 1: Total body weight gained in a span of 11 years

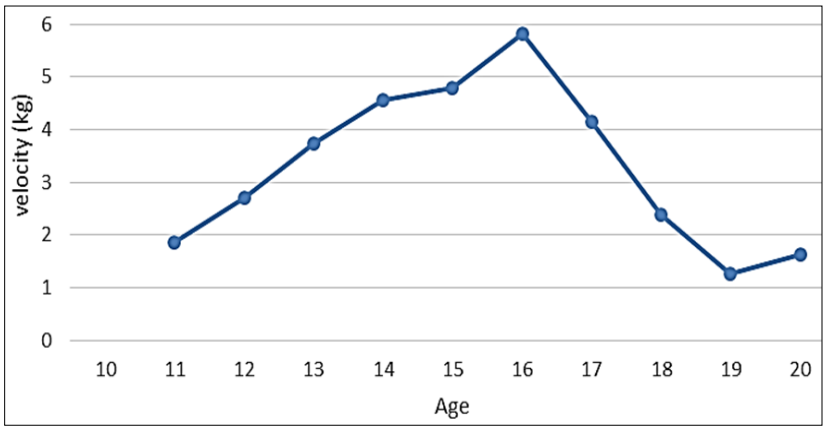

Fig 2: Year Velocity (V) of Delhi Jat boys from 10 to 20 years

Table 3: Mean, standard error of mean (S.E.M.), standard deviation (S.D.) and year velocity (V) of Delhi jat boys from 10 to 20 years

Height					
Age	**No.**	**Mean**	**S.E.M.**	**S.D.**	**V**
1 0	41	136.81	0.69	4.44	
11	35	141.06	0.89	5.25	4.25
12	34	145.20	1.09	6.37	4.14
13	36	150.30	1.16	6.97	4.83
14	38	155.80	1.10	6.77	5.77
15	37	160.67	1.43	8.72	4.87
16	35	167.97	1.21	7.13	7.30
17	37	169.99	1.15	6.97	2.02
18	35	170.76	1.07	6.33	0.77
19	31	170.84	0.93	5.18	0.08
20	30	171.10	1.14	6.24	0.26

It has been observed in table (3) that Jat boys of Delhi are 136.8 cms tall at the age of 10 yrs and 171.1 cms. At the age of 20 years as per table(3). There is a steep increase in body height up to 17 yrs. The adolescent spurt in height like weight, occurred at the age of 15.5 yrs with a velocity of 7.3 cms Fig. (3 & 4). There is an increase of 34.29 cms in height of Jat boys of Delhi rural area in a span of 11 yrs from 10 to 20 yrs. The Jat boys have, on the average, grown by 79.95% in height with respect to their 11 year's height during the period from 10 to 20 yrs out of which about 98.17% growth is during the adolescent peak velocity/year.

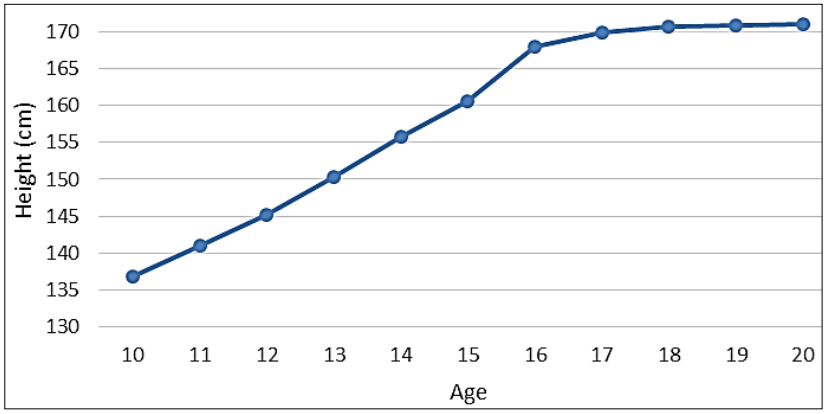

Fig 3: Jat boys of Delhi are 136.8cms tall at the age of 10yrs and 171.1cms.

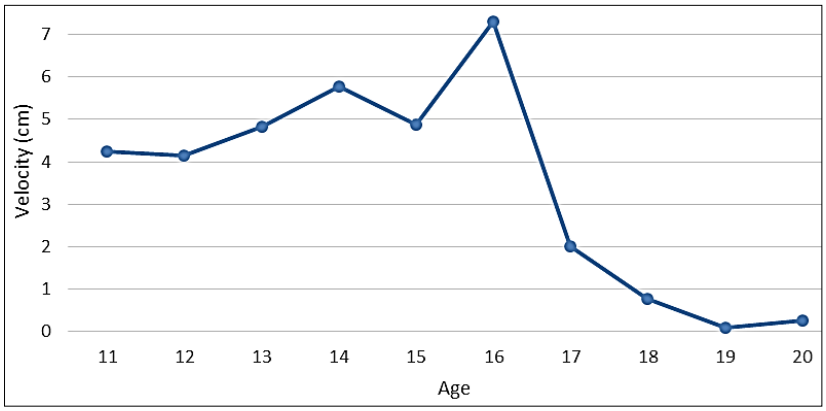

Fig 4: Year velocity (V) of Delhi Jat boys from 10 to 20 years

Discussion

The both kin-anthropometric variables have shown a moderate velocity during 10 to 13yrs and accelerated velocity thereafter with an adolescent peak velocity at the age of 15.5yrs only negligible growth has been observed in these variables from in these variables from 16 to 20 years of age. This extremely slow rate of growth may be attributed to the sampling error as well as to the difference in the timings of adolescent spurt from individual to individual and from measurement to measurement (Davenport, 1930; Malina, 1974) [4, 5]. Singh and Malhotra (1989) [15], generalize "it is quite interesting to note that during adolescent period, the boys and girls can be in all stages of their development.

Conclusion

The research work done on the line of kin anthropometric variables i.e. weight and height is helpful in sports. Weight and height reveal the growth line with ages as go forward. To know the patterns of growth spurt of a particular population group is meaningful. It helps to identify the talent at early ages. Sports performance goes on as growth develops of a youngster. In this cross sectional study, the Delhi Jat boys growth is smooth and suitable to sports. From very beginning, stature of a common Jat boy is marked with good height. The weight and height has been calculated from 10 to 20 years. At adolescent period, there is good growth sports with very marked increasing of height and weight. The velocity depicted in graph is consistent in normative manner. The population of Delhi Jat boys has potential talent to growth in sports. Already, this population has registered strong representation in sports at international level. The present work is window to know the potential of talent in Jat population.

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