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Evaluation of height status with age of Delhi boys

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Abstract
Evaluation of Height status with age plays an important role in guidance and in the choice of an appropriate game at an early age. This is very scientific and systematic approach and must be used in field of sport and physical education. In the present cross-sectional study of 389 boys were randomly selected ranging in age from 10 to 20 years. They belong to a genetic pool group of Delhi Jat boys (rural area), all residing in Delhi. In present study, a kin anthropometric variable i.e. height was taken to evaluate its height status to be used in at adult age. The percentile table of height was prepared as to evaluate the height of 10, 11, 12 and 13 years at adult age. The measured height on these particular ages have been plotted to various percentile values as per tabulation work for coming age at adult height status. Percentile values in the table are the indicators of Delhi Jat boys. This is for use in sports particularly in height sports. Parents can choose the sports for their daughters and sons in which sports they are interested and useful. Height is an important essential parameter of sports physique in future. So this is the method to identify the talent and use surely for future potential. It is to evaluate the height parameter at early age to use at adult age. It is good for sports performance that may be used by coaches and other experts in field of physical education and sports.

Keywords: Cross sectional, height, evaluation, adult status, sport, percentile, Delhi boys, anthropometry

Introduction
Today, the role of sports science has extended very much in sports especially in identifying the talent at early age as forth coming champion at Olympic and other global level competitions. There are the ways not only to identify the talent, also to evaluate the certain parameters of sports. Appropriate evaluation of adult physical status plays an important role in guidance and in the choice of an appropriate game at an early age. This may save much disappointment caused due to wrong selection of sport not in accordance with specific physical status (Kansal, 1981) [8]. The adult physical status of the children is largely dependent on heredity and hence, may be evaluated from the body dimensions of the parents. However, such predictions involve quite errors due to various possible combinations of the large number of genes controlling the adult physical status (Tanner, 1951) [13]. The regularity of growth enables us to predict the adult measurements from the value of these measurements at young age (Tanner, 1962, 1978) [14].

The process of growth through genetically controlled is subject of considerable alterations as a result of interaction with varied environmental conditions (Garn, 1952; Meredith, 1960) [6, 10]. Growth is not single, it is multiple e.g. combined expression of developmental and incremental factors (Fredrick, 1930) [5]. As the child grows, the capacity to perform physical activity also improves (Sodhi, 1980) [12]. Therefore, age is an important measure in determining the prospective sports performance at any level of competition. Wetzel (1941) [17] has developed the use of height to evaluate rate of physical development of children. After a few years, morph graph has been provided for the judgment of tempo and harmony of growth in height and weight (Decourt, 1949) [3]. According to Tanner (1964), athletes are born and made and physical training changes the physique of athletes with in the range set by genotype. Hirata (1966) [7] suggested that different countries should concentrate on the type of sports which suit best to the physique of their natives.

Numerous studies on the human growth patterns have indicated that an individual grows with differential growth rates but undergoes a quite uniform sequence of the infants whether from villages or cities.

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Very few studies have the collection and compilation of growth data on adequately representative samples. Banerjee and Bhathacharya (1968) [1], have revealed in their findings on the growth of schoolchildren from Bikaner. Bansal (1969) [2] suryed the growth of boys and girls belonging to farmers community from Punjab. Singh (1970) [11] reported growth in five somatometric traits of Punjabi Hindu Khatri boys from 11 to 18 years from Delhi. According to Falkner (1966) [4], growth rate of Boys and girls in height and in most other linear measurements is fastest shortly after birth and falls rapidly up to two years, slowly up to 5 years, still slowly from 10 to 11 years and 12 to 13 years respectively. Again it shoots up to attain the adolescent peak at around 12 to 14 years and 14 to 16 years respectively. Where after, there is a continuous increase in the rate of growth till the adult values are achieved.

Based on above cited literature, in present study, the kit has been constructed to serve the Jat boys for the evaluation of height from their respective ages I.e. 10, 11, 12 and 13 years.

Methodology
This is a cross-sectional study of 389 boys ranging in age from 10 to 20 years who belong to a genetic pool group of Delhi Jat boys (rural area), all residing in Delhi. Now, Only one anthropometric variable i.e. height has been taken for the evaluation of height from their respective ages I.e. 10, 11, 12 and 13 years. 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 the present study, the growth norms have been developed by applying the principles of statistical probability deviations from the mean values with help of percentiles. Marshall (1977) [9] has advocated that the variations in given measurements during the growth period are conveniently described in terms of percentiles. Tanner has described detailed procedures for the proper interpretations and use of percentiles. In general the children outside the 10th and 90th percentile of a particular population may be taken as suspicion. Those outside 3rd and 97th percentile should be considered unhealthy (abnormal) unless proved otherwise (Tanner, 1966). Specific standards for Delhi Jat boys in the form of percentiles have been constructed. In the current presentation shown in table (1), the height has been taken for evaluation of adult status with age. This is a reference a for Delhi Jat boys of age ranging from 10 to 20 years for those who are interested in sports. There are norms for other measurements also, but here, norms of the height have been used. This is a kit/ example presented in table (2) the norms how to be used.

Findings and Discussion

Table 1: Percentiles of Height for Delhi Jat boys from 10 to 20 years

Age	3rd	10th	25th	50th	75th	90th	97th
10	129.24	130.80	133.80	136.40	139.75	143.75	147.77
11	130.80	132.96	138.60	141.10	144.20	149.22	151.60
12	134.53	136.25	140.47	145.20	147.62	156.35	157.98
13	138.93	140.31	144.75	149.55	156.37	160.09	162.35
14	141.48	145.78	151.52	155.10	160.25	165.84	168.24
15	146.66	148.18	152.90	162.20	166.50	172.24	178.54
16	147.46	160.71	163.20	168.00	173.00	177.64	180.88
17	155.07	159.56	165.65	169.60	173.90	178.84	183.23
18	158.68	161.58	166.20	170.50	176.50	180.82	183.23
19		164.32	167.30	169.20	174.20	179.88	
20		160.30	166.07	172.80	175.27	179.85	

In table (2), the percentile values have been given of Height measurement of Delhi Jat boys. The age is ranging for 10 to 20 years. The values have been plotted under percentile hierarchy from 3rd to 97th. These values represent percentile norms of height for Delhi Jat population. The data shown is a help in hands to measure the age of particular person from this community. With an example like the percentile norms of 10 year boys is from129.24 To 147.77 from 3rd to 97 percentile. In the same manner the percentile values from all age groups from 10 to 20 years have been given. The table (1) shows the total picture of height percentiles for Delhi jat boys.

Table 2: Evaluation of Height status of Four Jat Boys (A, B, C, D) by using the Percentile Norms

	Age	Measured Height (cm)	50th percentile value	Percentile status per fig	Evaluation
A	10	138	136.4	between 50th & 75th	Average status
B	11	150	141.1	between 90th & 97th	Very good
C	12	125	145.2	below 3rd	Some Abnormality suspected
D	13	139	149.5	between 3rd & 10th	Refer to physician may be genetically small Boy or marginal case should be followed again

In the table (2), it is the presentation of case data of measured height. That value is plotted against the percentiles in table age wise. For example 138 cm height of 10 year boy comes in the plot of 50th and 75th percentile which is average height. The height of 11 year boy is 150 cm comes in 90th and 97th percentile. That is good height.

The height of 12 year's boy is 125 then it is below 3rd percentile which is abnormal and genetically small boy. Another boy is of 139 cm height, he is between 3rd and 10th percentile, who is case of abnormality.

Discussion

This is simplest and very important kit for the evaluation of height status of Jat boy with respect to their age. it is based on the scientific values of height upon age. It has to simply plot the measured height on the height percentile as in the table (1). If the value thus plotted falls between 25th to 75th, the boy is rated to posses an average height. If the plotted value lies above 75th but below 90th percentile then the boy is above average. And if his plotted value lies below 25th percentile but above 3rd, the boy should be evaluated as being below average of his height status. In case the plot lies below 3rd or above 97th percentile, the boy's height status should be taken with suspicions to check some morphological abnormality. He should be referred further clinical investigations to child specialist. Though, the kit is applicable in general for boys 10 to 20 years. It should be followed only for the boys aged 10 to 11 years. It should be avoided any evaluating error due to early or late adolescent growth spurt. To ensure proper evaluation, the process should be repeated at least twice at an interval of six months between the two examination dates.

Conclusion

The norms prepared in form of percentiles may be used to evaluate the height status of Delhi Jat boys. Any boy form the population group may be evaluated as in shown in table (2). The data shown is a help in hands to measure the age of particular person from this community. This is not only the way to identify the talent for sports, but also to evaluate the certain parameters used in sports. Accurate evaluation of height status plays an important role in the choice of an appropriate game at an early age. This may save much disappointment caused due to wrong selection of sport not in accordance with specific physical status. It is particularly the games that require the greater height in team games and individual games. This is a kit to follow for coaches and experts in physical education and sports. This is also helpful at family level to be convinced to parents. To make the sports potential to be materialized in sports, parents are underpinning the social support.

References

1. Banerjee S, Bhattacharya AK. Body Size and Skinfold Thickness of School Going and Youth of Bikaner, Rajsthan. Pro. Nat. Inst. Sci. India 1968;34:303.
2. Bansal IJS. Trends in Growth in Height and Weight among Punjabi Boys and Girls. Anthropologist. Special Volume 1969, 175.
3. Decourt J. Annal. Endocrinol. Growth And Exercise: In sports Training Principles, Lepus Books, London. Bois D and EF 1949.
4. Falkner F. Human Development. W.B. Saunders Company Piladelphia 1966.
5. Fredrick WC. A Study of Stature in Relation to Physical Performance. Res. Quar 1930;1:39-45.
6. Garn SM. Physical growth and development. Am. J Phys. Anthrop 1952;17:169-192.
7. Hirata K. Physique and Age of Tokyo Olympic Champions. J Sports. Med. Phys. Fitness 1966;6:207.
8. Kansal DK. A study of Age Changes in Physique and Body Composition in Males of Two Communities of Punjab. Ph.D. thesis, Punjabi University, Patiala 1981.
9. Marshall WA. Human Growth and Disorders. Academic Press, London 1977.
10. Meredith HV. Methods of Studying of Physical Growth. In; Hand Book of Research methods in Child development, P.H. Mussen. Johan Willey & Sons, Inc., New York 1960, 201-251.
11. Singh R. A Cross Sectional Studyof Growth of Five Somatotype Traits of Punjabi Boys aged 11-18 years. A.J. Phy. Anthrop 1970;32:129-138.
12. Sodhi HS. Anthropometry and Body Composition of Indian national volleyball players. Volleyball technical Journal 1980;5:59.
13. Tanner JM. Some Notes on the reporting of Growth rate. Hum. Biol 1951, 93-159.
14. Tanner JM. Growth at Adolescence. IInd ed. Blackwell Scientific publication. Oxford 1962.
15. Tanner JM. Variabiltiy of Growth and Maturity in New Born Infants, New York, John Wiley and Sons 1974, 77-73.
16. Tanner JM. Foetus into Man- Physiological growth from Conception to Maturity. Harvard University Press, Cambridge 1978.
17. Wezel NC. Physical Fitness in Terms of Physique Developemnt and basel metabolism. J Am. med. Ass 1941;116:1187-95.