

EVALUATION OF BODY STATURE USING RADIUS IN MEDICAL STUDENTS: A CROSS SECTIONAL STUDY

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ABSTRACT

Body stature is usual heights of a person in an upright position. Assessment of body stature has a key importance in the field of anthropometry and forensic discipline research. In this relation, we have derived regression equation formula; to estimate stature from the length of radius bone in south Indian medical student population. This study was conducted in 150 medical college students of Telangana zone of South India. The age group was between 18 to 22 years. Each student's height and percutaneous radius length were measured in centimetres with the help of measure scale and spreading calipers; The data was analysed statistical calculation, by using SPSS software version-19. The correlation coefficients for right and left a radius in males are 0.591 and 0.598 whereas in females 0.543 and 0.551 respectively. The variation in mean length of radius in male and female students was statistically significant ($P < 0.001$). The radius will length will assist in better reliability in the evaluation of an individual stature in all the cases of medico-legal anthropometry scenarios.

KEY WORDS: Radius length, Body Stature, Anthropometry, Medico-legal aspects.

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INTRODUCTION

Body stature consists of heights of a person in an upright position. Recognition of a human being from decomposed and mutilated due to natural calamity is a crucial for all medico-legal and civilized grounds [1]. Generally, body Stature can be evaluated by employing either anatomical/mathematical means. To calculate the living stature of an individual using the anatomical method, rectification factors that compensate for soft tissue need to be added [2-4].

Reasonably many factors are taken into concern for establishing the identity in these cases. Body stature is measured as one of the key parameters for personal identification reconstruction plays an essential role in the identification of individuals. Stature varies with age, sex, ethnicity. Telkka in his study opined that all racial group needed a separate formula for estimation of stature [5]. There is a well-known association between stature and dimensions of various body parts which allow forensic and anatomic experts to assess stature [6]. There

are very few studies about anthropometric-relationship between the length of radius and stature [7-8], for this purpose, we evaluated the body stature using radius in medical college students in Telangana area, South India.

MATERIALS AND METHODS

The present study comprised of a total 150 Medical college students belongs to 1st M.B.B.S of Medi Citi Institute of Medical Sciences, Medchal Mandal, Ranga Reddy District, Telangana, India, during October 2009 to December 2009. Their age ranged between 18 to 22 years. Institutional Ethics Committee approved the study protocol. The students with major systemic diseases, history of previous fractures, orthopaedic malformation were excluded from this study. All the students; height and length of right and left radius were recorded separately. The measurements were taken at a fixed time of a day at around 12 p.m to eliminate the diurnal variation.

Stature was measured as the distance from crown to heel in standing erect posture with a calibrated anthropometer. Radius length was measured, using spreading calipers, as the distance between the most prominent and palpable part of the radial head to the styloid process. Lengths of left and right radius were taken separately.

Measurements of the length of the right and left radius were taken separately for calculation. The data was analysed statistically SPSS software version-19 for calculation of Mean, SD, correlation coefficient, Regression coefficient, the value of constant and 't' test for the correlation coefficient.

RESULTS

A total of 150 students participated and out of which 98 were female, and 52 were male students.

Table 1 shows that in male subjects, mean height in males 164.73±5.73 cm, females 152.94±3.96 and the mean length of right radius is 21.84±1.45 cm, with range of 23.60 – 29.40 and mean length of left radius is 21.25±1.44 cm with range of 23.60 – 30 cm and in the females, mean height is 152.94±3.96 cm, and mean length of right

radius is 20.67±1.12 cm with range of 21.60 – 27.20 cm and mean length of left radius is 20.60±1.13 cm with range of 21.50 – 27.70.

Table 1: Parameters in male and female subjects.

Parameters	Mean ±SD		Range (min – max)	
	Male	Female	Male	Female
Height	164.73±5.73	152.94±3.96	159-186	144-166
Length of right Radius	21.84±1.45	20.67±1.12	23.60-30.40	21.60-27.20
Length of left Radius	21.25±1.44	20.60±1.13	23.50- 30.00	21.50-27.70

DISCUSSION

The estimation of stature is of utmost importance whenever bodies are found in mutilated state or when skeletal remains are available. The present study was done to evaluate the stature from the percutaneous length of the radius on living subjects in a medical student population belongs to South India. Many researchers [9-11] have shown that regression formulas using a combination of bone lengths show better accuracy in predicting total skeletal height than those using single bone. The positive linear relationship between stature and the lengths of left and right radius showed a strong correlation as is evident from the scatter plots. Our findings are also comparable with Dolan Champa Pal et al study [7] who has studied in Indian Bengali males and Mike IN et al [8] study about South-West Nigerian population.

CONCLUSION

From the present study, it has been concluded that the mean height and length of slightly more in males than in females. There is a positive correlation between stature and length of the radius. Simple linear regression equation so far derived can be used for estimation of height in Telangana region of South India. This reasonable exercise may be useful in all medico-legal examinations and anthropometry procedures.

Conflicts of Interests: None

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