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Original Research Article

To Find Out Bilateral Differences in Anthropometry of Percutaneous Length of Tibia in Both Sexes

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Abstract:

Background & Methods: The aim of the study is to find out bilateral differences in anthropometry of percutaneous length of tibia in both sexes. present study individuals of age more than 21 years were included. Bertillon system is based on the principle that after the age of 21 years the dimensions of the skeleton remain unchanged and also that the ratio in size of different parts to one another varies considerably in different individuals. As such, this is applicable only to adults.

Results: Mean stature in male subjects was 166.97 ± 5.63 cm. In this study maximum height reported was 180.3 cm while, minimum height was 151.5 cm. The range in stature of male was male 151.5-180.3 cm. Mean stature in female subjects was 155.31 ± 5.21 cm. In this study maximum height recorded was 168.2 cm while, minimum height was 141.6 cm. The range in height of female subjects was from 141.6 to 168.2 cm.

Conclusion: In the present study it was found that there exists a statistically significant correlation between percutaneous tibial length and stature in both sexes. The correlation between percutaneous tibial length and stature was found to be more in males than females, therefore indicating percutaneous tibial length to be a better predictor of stature.

Keywords: Bilateral, Anthropometry, Percutaneous & Tibia.

Study Design: Observational Study.

Introduction

Anthropometry has arisen back as early as ancient Egypt and Greece. The term ‘Anthropometry’ was first used by German physician Johann Sigismund Elsholtz during seventeenth century for his graduation thesis titled “Anthropometria”. He also invented the anthropometer [1].

The history of anthropometry includes and spans various concepts, both scientific and pseudoscientific, such as craniometry, paleoanthropology, biological anthropology, phrenology, physiognomy, forensics, criminology, phylogeography, human origins, and craniofacial description, as well as correlations between various anthropometrics and personal identity, mental typology, personality, cranial vault and brain size, and other factors [2]. Anthropometry (from Greek anthropos, "human", and "measure") refers to the measurement of the human individual [3]. The term ‘forensic anthropometry' can be coined for this branch of applied physical anthropology, involving the use of methods/techniques of anthropometry in forensic/legal context. In other words, “forensic anthropometry is a scientific specialization emerged from the discipline of forensic anthropology dealing with identification of human remains with the help of metric techniques”. It is a branch of anthropology that involves the quantitative measurement of the human body [4].

Human height varies greatly between individuals and across populations for a variety of complex biological, genetic, and environmental factors. Due to methodological and practical problems, its measurement is also subject to considerable error in statistical sampling. The average height in genetically and environmentally homogeneous populations is often proportional across a large number of individuals [5]. Exceptional height variation (around 20% deviation from a population's average) within such a population is sometimes due to gigantism or dwarfism, which are caused by specific genes or endocrine abnormalities [6].

Material and Methods

The study was conducted on 225 deceased cases. In the present study individuals of age more than 21 years were included. Bertillon system is based on the principle that after the age of 21 years the dimensions of the skeleton remain unchanged and also that the ratio in size of different parts to one another varies considerably in different individuals. As such, this is applicable only to adults. The study was carried out for a period of 01 year. In the study population, the subjects included are irrespective of caste, religion, dietary habits and socioeconomic status. The measurement taking includes height in centimetres, percutaneous length of tibia in centimetres to the nearest millimetres.

A participant refers to the entire group of people or items that meet the criteria set by the researcher. So the participant/ source for the present study consist of all the cases which were brought for autopsy in the mortuary of Forensic Medicine Department of Govt. Medical College, Ratlam, M.P

Inclusion Criteria: All cases of post mortem examination where age is more than 21 years.

Exclusion Criteria: All subjects with skeletal abnormalities and deformities e.g., fracture, dislocations, poliomyelitis, osteoporosis, rickets, scoliosis and kypho-scoliosis etc.

Result

Table 1: Age wise distribution of subjects

S. No.	Age group (years)	No. of Cases	Percentage (%)
1.	21 -25	23	10.2
2.	26 -30	22	9.7
3.	31-35	25	11.1
4.	36 -40	26	11.5
5.	41 -45	23	10.2
6.	46 -50	25	11.1
7.	51 -55	24	10.6
8.	56 -60	22	10.2
9.	61 -65	11	5.7
10.	66 -70	05	3.1
11.	71 -75	04	1.7
12.	76 -80	02	0.8
13.	81 -85	04	1.7
14.	86 -90	02	0.8
15.	91-95	02	0.8

Age wise distribution of the male subjects. In this study maximum number of cases were in age group of 36-40 & 46-50 years

Table 2: Distribution of height among male study subjects

Variables	Mean	STD DEV	Max	Min	Range
HT in cm	166.97	5.63	180.3	151.5	152.4-181.7

Mean stature in male subjects was 166.97 ± 5.63 cm. In this study maximum height reported was 180.3 cm while, minimum height was 151.5 cm. The range in stature of male was male 151.5-180.3 cm.

Table 3: Distribution of height among female study subjects

Variables	Mean	STD DEV	Max	Min	Range
HT in cm	155.31	5.21	168.2	141.6	142.9-169.9

Mean stature in female subjects was 155.31 ± 5.21 cm. In this study maximum height recorded was 168.2 cm while, minimum height was 141.6 cm. The range in height of female subjects was from 141.6 to 168.2 cm.

Table 4: Distribution of anthropometric parameters for percutaneous tibial length

Variables	RPTL in cm	LPTL in cm	Av. PTL in cm
MEAN	39.47	39.48	39.48
STD DEV	1.76	1.76	1.76
MAX	50.1	50.1	50.1
MIN	35.1	35.1	35.1
RANGE	35.1-50.1	35.1-50.1	35.1-50.1

Table 5: Correlation between subjects

Variables	Correlation Coefficient (r)	Correlation	Impression
Correlation between RPTL & LPTL	0.98	P=0.000*	Strong, positive, statistically significant correlation
Correlation between Av.PTL & HT	0.53	P=0.000*	Strong, positive, statistically significant correlation

The table shows the correlation of stature.

Discussion

The males were found to be taller than females with the bisexual differences being statistically significant ($p<0.001$). In the present study mean age of the male subjects was found to be 45.17 years whereas in female subjects were found to be 43.84 years [7].

An attempt was made to correlate percutaneous tibial length with stature and derive regression equations to calculate stature from combined length of forearm and hand. The percutaneous tibial length and stature correlation

coefficient (r) in males and females were 0.760 and 0.731 respectively. On the basis of this percutaneous tibial length and stature was found to be positively correlated and the association was highly significant in both sexes [8].

Regression equations were derived to estimate stature from percutaneous tibial length using regression analysis for both males and females separately.

In the present study an attempt was made to correlate percutaneous tibial length with stature and derive multiplication factors for both sexes. The multiplication factor for percutaneous tibial length was found to be 4.08 and 4.16 for male and female respectively. Multiplication factors become essential in cases of forensic analysis when only lower limb is available for analysis and the approximate stature is to be estimated [9].

Conclusion

In the present study it was found that there exists a statistically significant correlation between percutaneous tibial length and stature in both sexes. The correlation between percutaneous tibial length and stature was found to be more in males than females, therefore indicating percutaneous tibial length to be a better predictor of stature.

References

1. Trivedi A, Jehan M, Saxena S. Height estimation using percutaneous ulnar length in Gwalior region. IJMPR. 2014;3(2).
2. Mishra M, Triwari A, Naik DC. Determination of individual's height by postcranial measurements in Rewa region of Madhya Pradesh. Int J Med Sci Public Health. 2014;3(10):12729-82.
3. Sutay S, Surwade V, Tiwari UK, Singh NK, Chauhan SC. Study of stature by foot length measurement in Madhya Pradesh. International Journal of Bioassays 2014, ISSN: 2278-778X.
4. Banik SS. Interrelationships between height and selected linear body dimensions and estimation of sex in Nepali-Speaking adults from Naxalbari, Darjeeling. J Forensic Res. 2016;7: 354.
5. Rani Mukta , Tyagi AK, Verma SK, Kohli A. Estimation of stature from percutaneous measurements of legs (1999-2000). Journal of Forensic Medicine and Toxicology 2004; 21(1):1 2-14.
6. Mehta AA et al. Correlation of percutaneous tibial length with body height and estimation of stature in living central india population International Journal of Anatomy and Research, Int J Anat Res 2015, Vol 3(2):1159-61. ISSN 2321- 4287.
7. Khatun SS et al. Estimation of stature from percutaneous tibial length in indian population International Journal of Anatomy and Research, Int J Anat Res 2016, Vol 4(3):2571-76. ISSN 2321-4287.
8. Yadav S., Pathak B. Estimation of Stature from the Measurement of Forearm, Hand, Leg, and Foot Dimensions in Uttar Pradesh Region International Journal of Therapeutic Applications, Volume 35, ISSN 2320-138X, 2018.
9. Moshkdanian G, Zadeh SM, Ghoroghi FM, Mokhtari T, Hassanzadeh G. Estimation of Stature from the Anthropometric Measurement of Lower Limb in Iranian Adults. Anat Sci Res Cent. 2014;11(3):149-54.