|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2020: 79.44
Original Research Article
Volume 5, Issue 12; December: 2021; Page No. 174-176

TO EVALUATE BILATERAL DIFFERENCES IN ANTHROPOMETRY OF PERCUTANEOUS LENGTH OF TIBIA IN BOTH SEXES.

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Article Info: Received 15 November 2021; Accepted 25 Dec. 2021
doi: https://doi.org/10.32553/ijmbs.v5i12.2582
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Conflict of interest: No conflict of interest.

Abstract

Background & Method: The aim of this study is to evaluate bilateral differences in anthropometry of percutaneous length of tibia in both sexes. 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 consists of all the cases which were brought for autopsy in the mortuary of Forensic Medicine Department

Result: In the present study a strong correlation was found between right and left percutaneous tibial length (r=0.999). Whereas a significant correlation was found between average percutaneous tibial length and stature (r=0.760) in males

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 in males than females.

Simple linear regression equations have been derived to estimate stature from percutaneous tibial length. The regression equations derived concluded that stature can be estimated precisely from percutaneous tibial length parameters even when details are unknown.

Keywords: bilateral, anthropometry, percutaneous & tibia.
Study Designed: Observational Study.

Introduction

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. Anthropometry (from Greek anthropos, "human", and "measure") refers to the measurement of the human individual. 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.[1,2,3]

Human height is the vertical distance from the bottom of the feet to the top of the head in standing erect position.[4] Stature is defined, as “The vertical distance between the highest point of vertex and the heel touching the floor”.[5] Many human features have been used to estimate stature owing to their established relationships with stature. It is well known that there are definitive proportionate relationships of different degrees between the height of the person and various dimensions/measurements of the parts of the body like head, trunk and lengths of the upper and lower limbs.[6]

Identification of dead body and proof of “corpus delicti” is essential and integral part of any criminal and civil justice delivery system throughout the world. The main part of corpus delicti (i.e. the body of the offence; the essence of crime) is the establishment of the identity of the dead body Identification of an individual is very important in criminal cases like assault, murder, rape, disputed paternity, impersonation etc. and in civil cases like marriage inheritance, disputed sex etc.[7&8]

Material & Method

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 consists of all the cases which were brought for autopsy in the mortuary of Forensic Medicine Department, Index Medial College Hospital & Research Centre, Indore from May 2019 To

April 2020 of both the genders of age more than 21 years during the study period belonging to Indore region.

Firstly detailed history was taken both regarding the incident and complete clinical history including operative procedures, if any. Detailed individual demographic data including the height, sex, age etc. were also recorded on the pre-structured Performa. The procedure, aims and objectives of the study was explained to each relative of the study subjects. Written informed consent was taken prior to the research after giving detailed information to the relatives of the subjects regarding the study. Anthropometric measurements of percutaneous length of tibia were taken independently on the left and right side of each individual.

Inclusion Criteria

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

Exclusion Criteria

1. All subjects with skeletal abnormalities and deformities e.g., fracture, dislocations, poliomyelitis, osteoporosis, rickets, scoliosis and kypho-scoliosis etc.
2. Dwarfism and gigantism.
3. All Subjects with amputated lower limbs.
4. All Subjects below Age 21 years.

Results:

Table 1: Sex wise distribution of male and female

Sex	Male	Female
Total Number of Subjects	100	100

Table 2: Distribution of anthropometric parameters for percutaneous tibial length in male subjects

Variables	RPTL in cm	LPTL in cm	Av. PTL in cm
MEAN	41.61	41.73	41.61
STD DEV	2.76	2.76	2.76
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 3: Distribution of anthropometric parameters for percutaneous tibial length in female subjects

Variables	RPTL in cm	LPTL in cm	Av. PTL in cm
MEAN	36.91	36.92	36.91
STD DEV	2.12	2.11	2.11
Max	42.7	42.7	42.7
Min	32.3	32.3	32.3
Range	32.3-42.7	32.3-42.7	32.3-42.7

200 subjects (100 male + 100 females) were selected for the study. In the present study **M/F** ratio was **1:1**. In this study mean age of the **male** subjects was found to be **46.79 ± 14.85 years** whereas in **female** subjects were found to be **44.41 ± 14.10 years**. The mean right and left percutaneous tibial length in males was **41.61 ± 2.76 and 41.73 ± 2.76** respectively, whereas mean stature was found to be **163.68 ± 5.63 cm** in males. On the other hand the mean right and left percutaneous tibial length in females was **36.91 ± 2.12 cm** and **36.92 ± 2.11 cm** respectively, whereas mean stature in the female subjects was **155.37 ± 5.21 cm**. The mean of average percutaneous tibial length was found to be **41.61 ± 2.76 cm** in males **and 36.91 ± 2.11 cm** in female study subjects.

In the present study a strong correlation was found between right and left percutaneous tibial length (**r=0.999**). Whereas a significant correlation was found between average percutaneous tibial length and stature (**r=0.760**) in males.

Discussion

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.

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 [9].

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 [10]. 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.

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 in males than females.

Simple linear regression equations have been derived to estimate stature from percutaneous tibial length. The regression equations derived concluded that stature can be estimated precisely from percutaneous tibial length parameters even when details are unknown.

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