IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 6 Ver. 9 (June. 2018), PP 68-69
www.iosrjournals.org

Study of the Correlation of Bicondylar and Intercondylar Width with the Length of Femur in Uttarakhand Population

Prasad V[1], Jagdish P[2]*

[1]*Dr. Varuneshwar Prasad, Senior Resident, Department of Anatomy, Shridev Suman Subharti Medical College, Dehradun, UK*
[2]*Dr. Prerna Jagdish, Assistant Professor, Department of Anatomy, KD Medical College, Mathura, UP*
Corresponding Author: Jagdish P

Abstract: *One hundred twenty femora available in the Bone bank of Anatomy Department, HIMS, SRHU, Dehradun, were measured and an observational morphometric study was done. Bones having any deformity, anomaly, unossified, decomposed, in poor condition due to injury or damaged were excluded from the study. Only dry normal adult human femora of both side and both sex were considered. Parameters considered for the morphometric measurement: Femoral Length (FML), Intercondylar Width (ICW) and Bicondylar Width (BCW). Data was compiled, tabulated and analysed statistically, p value of <0.05 was taken as significant. Pearson's correlation coefficient was used to examine the association between FML to BCW and ICW. The data was analysed by SPSS statistical software for window version 20.*

Keywords: *Bicondylar Width, Intercondylar Width, Femur*

Date of Submission: 01-06-2018 Date Of Acceptance: 18-06-2018

I. Introduction

Changes in the pattern of crime and increase in the number of homicides have made establishment of identity important. There are various parameters of identification such as race, age, sex and stature; among them individual's stature is one of the vital and inherent characteristic feature of human identification (1). Stature estimation is very important in those cases where only fragmentary or mutilated remains of an unknown person are recovered. Anthropometry is a single most universally applicable, inexpensive and non-invasive technique of assessing the size and proportions of the human body. Anthropometry has been used worldwide to estimate body size and stature for many years (2).

II. Aims & objectives

Study of the correlation of the bicondylar and intercondylar widths with the length of femur in the Uttarakhand population

III. Material & methods

One hundred twenty femora available in the Bone bank of Anatomy Department, HIMS, SRHU, Dehradun, were measured and observational morphometric study was done. In order to carry out measurements of femora, femora were cleaned, dried and processed, then examined visually in day light. Further, bones having any deformity, anomaly, unossified, decomposed, in poor condition due to injury or damaged were excluded from the study. Only dry normal adult human femora of both side and both sex were considered.

Parameters considered for the morphometric measurement are length of femur (FML), Intercondylar Width (ICW) and Bicondylar Width (BCW). Measurements were taken by the help of anthropometric instruments consisting of vernier sliding caliper, osteometric board and steel tape. Data was compiled, tabulated and analysed statistically.

IV. Result

The length of femur was found between ranges from 38.80 cm to 51.30 cm, as shown in Table 1. Mean value of 43.82 cm was reported amongst 120 data. Standard deviation for FML data set was reported as 2.52. The Bicondylar Width of femur was found to range between 6.03 cm to 8.0 cm, as shown in Table 1. Mean value was found to be 7.14 cm. Standard deviation for BCW data set was reported as 0.42. The Intercondylar Width of femur was found between ranges from 1.0 cm to 1.9 cm, as shown in Table 1. Mean value was found to be 1.45 cm. Standard deviation for ICW data set was reported as 0.22.

Table 1: Mean values of Femur length (FML), Bicondylar Width (BCW) and Intercondylar Width (ICW) (n=120)

Variables	Min	Max	Mean±SD
FML (cm)	38.8	51.3	43.82±2.52
BCW (cm)	6.03	8	7.14±0.42
ICW (cm)	1	1.9	1.45±0.224

In order to examine the behavior of FML with respect to change in ICW, development of correlation was developed between FML-ICW. Results of correlation test were given in Table 2. This correlation between FML-ICW was found to be positive with correlation coefficient (Pearson Correlation) of 0.23.

Table2: Correlation between BCW and ICW with FML (n=120)

Variables	coefficient of correlation (r)	p value
FML-BCW	+0.18	0.049
FML-ICW	+0.231	0.011

*Pearson Correlation test ($p< 0.05$ – significant)

V. Discussion

Gehring KD estimated body height with measurements of femoral fragments (3). Stevenson PH measured cadaver length and dry bone lengths of 48 northern Chinese male skeletons in mongoloid group and find out the ratio between bone length and height of individual (4). Pan N measured the maximum lengths of femur and other long bones of extremities in 142 male and female Hindus (east Indians), in fresh state with articular cartilages covering the ends (5). Some differences were found in mean values of FML, ICW, BCW measurements when compared to other studies. This may be due to the factors such as age, sex, race, environmental factors, nutrition, physical development and genetic factors affecting bone growth. Bidmos MA found significant sex related differences in measurements of fragments of femur in indigenous South Africans (6). Peterson analyzed 431 skeletons and found that differences of femoral length were sex independent (7). In the present study investigation data were sex aggregated.

In the present study positive Pearson's correlation coefficient 0.18 and 0.23 was found for FML-BCW and FML-ICW respectively. For both correlations, p value was 0.49 and 0.11 respectively, which were within permissible significant limit. Hence, the femoral length can be estimated from distal fragmentary remains of femur. Bindurani MK et al found positive correlation coefficient 0.72 for right and 0.31for left between FML-BCB and p value were 0.001 for right and 0.007 for left respectively (8). Didia BC et al found no relationship between FML and ICW ($p > 0.05$) (9). In present study BCW and ICW showed positive correlation with FML.

References

[1]. Sunil, Dikshit PC, Aggrawal A. Estimation of Stature from Hand Length. JIAFM. 2005;27(4):219-21.
[2]. Krogman Wilton Marion. The Human Skeleton in Forensic medicine. 2nd edition. USA: Charles. C. Thomas publisher; p. 302-49.
[3]. Gehring KD, Graw M. Determining body height by the femur and femoral fragments. Arch Kriminol. 2001; 207(5-6):170-80.
[4]. Steveson PH. On racial differences in stature long regression formulae, with special reference to stature reconstruction formulae for Chinese. Biom. 1929; 21(1-4): 303.
[5]. Pan N. Length of long bones and their proportion to body height in Hindus. J Anat. 1924; 58: 374-8.
[6]. Bidmos MA. Estimation of stature using fragmentary femora in indigenous South Africans. Int J Legal Med. 2008;122(4):293-9.
[7]. Peterson HC. On the accuracy of estimating living stature from skeletal length in the grave and by linear regression. Int. J. Osteo-archaeology.2005; 15: 106-14.
[8]. Bindurani MK, Kavyashree AN, Asha KR, Subhash L. Estimation of length of femur from morphometric measurements of its distal fragments in South Indian population. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2014;5(5):1300-06.
[9]. Didia BC, Nwajagu GN, Dapper DV. Femoral Intercondylar Notch (ICN) width in Nigerians: Its relationship to femur length. West Afr J Med. 2002;21(4):265-7.

Prasad V, Jagdish P."Study of the Correlation of Bicondylar and Intercondylar Width with the Length of Femur in Uttarakhand Population."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 6, 2018, pp 68-69.