Original Article

https://doi.org/10.3329/cbmj.v14i2.83289

Osteometric Study of the Neck Circumference of the Dry Human Fibula in an Adult Bangladeshi Population

*Biswas TR[1], Kar T[2], Haque SMA[3], Latif MS[4]

Abstract

A cross-sectional, descriptive study was done in the Department of Anatomy, of Mymensingh Medical College, Mymensingh, Bangladesh, from January to December of 2023, to measure the neck circumference of the dry human fibula in an adult Bangladeshi population. This study was done using 300 dry human fibula (right siders 152 and left sided 148) samples, which were selected through purposive sampling technique. Any damaged, unossified, fractured fibula were excluded in this study. Data was collected, scrutinized and compiled, then analyzed using Microsoft Excel. Data was presented through histogram. The mean neck circumference of the right sided fibulae was 3.4±0.50 cm. The neck circumference of 152 right sided fibulae ranged between 2.5 cm and 5 cm. The mean neck circumference of the left sided fibulae 3.59±0.55 cm. The neck circumference of 148 left sided fibulae ranged between 2 cm and 5 cm. Our data is expected to enrich the information pool for the general physicians, orthopaedic surgeons, forensic specialists and anthropologists to improve their knowledge and understanding regarding various anatomical parameters of human fibula.

CBMJ 2025 July: vol. 14 no. 02 P:146-148

Keywords: Osteometry, neck circumference, fibula, Bangladeshi people

Introduction

Neck of the fibula is a constriction below the head, connecting it with the shaft. The common peroneal nerve is related to the posterolateral aspect of neck and anterior tibial artery on its medial aspect.[1] The neck of the fibula is important, because it contains the common fibular nerve winds around the neck of the fibula and divides into its terminal branches.[2,3] The osteometric data of fibula is limited in literature and very few studies have been done where the complete fibula has been evaluated. Due to this extensive clinical application, forensic and demographic significance of the fibula and lack of adequate studies on fibula our present study was undertaken.[3] The objective of the present study was to measure the neck circumference of the dry human fibula in an adult Bangladeshi population.

Methods

This cross-sectional, descriptive study was done in the Department of Anatomy, of Mymensingh Medical College, Mymensingh, Bangladesh, from January to December of 2023. We collected 300 fully ossified dry human fibula, from 1st and 2nd years MBBS students and the museum of the Department of Anatomy of Mymensingh Medical College. Of 300 fibulae, 152 bones were right sided and 148 bones were left sided. A non-random purposive sampling technique was used for sample selection. Those bones having any deformity, fracture or visible pathology were excluded from this study. Neck circumference was measured by using flexible measuring tape in the

1. *Dr. Tithi Rani Biswas, Assistant Professor, Department of Anatomy, Army Medical College Jashore, Bangladesh.
2. Dr. Tanmoy Kar, Community Ophthalmology Department, Bangabandhu Sheikh Mujib Medical University, Bangladesh.
3. Dr. Shah Md. Atiqul Haque, Assistant Professor, Department of Anatomy, Mymensingh Medical College, Bangladesh.
4. Dr. Md. Safat Latif, Lecturer, Department of Anatomy, Mymensingh Medical College, Bangladesh.

Address of Correspondence:
Email: tithi0081@gmail.com

constricting part immediately below the head of the fibula and expressed in cm (Fig. 1).

Fig. 1: Photograph showing the procedure of measurement of neck circumference of human fibula

Data was collected, scrutinized and compiled, then analyzed using MS-Excel. Data was expressed as mean±SD (standard deviation). Data was presented through histogram.

Ethical clearance for this study was obtained from the institutional Review Board of Mymensingh Medical College, Mymensingh, Bangladesh (Memo No. MMC/IRB/2023/575).

Results

In the present study, we measured the neck circumference of 300 fully ossified dry human fibulae. The mean±SD of the neck circumference of the right sided fibulae was 3.4±0.50 cm. The neck circumference of 152 right sided fibulae ranged between 2.5 cm and 5 cm. More than 91% samples were measured within the range of 3 cm to 4 cm (Fig. 2). The mean ± SD of the neck circumference of the left sided fibulae 3.59 ± 0.55 cm. The neck circumference of 148 left sided fibulae ranged between 2 cm and 5 cm. More than 85% samples were measured within the ranged of 3 cm to 4 cm (Fig. 3).

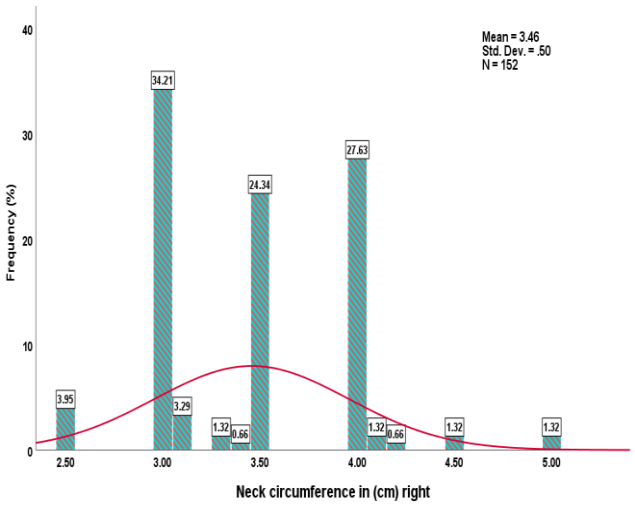

Fig. 2: Histogram showing the frequency distribution of neck circumference of the right fibula

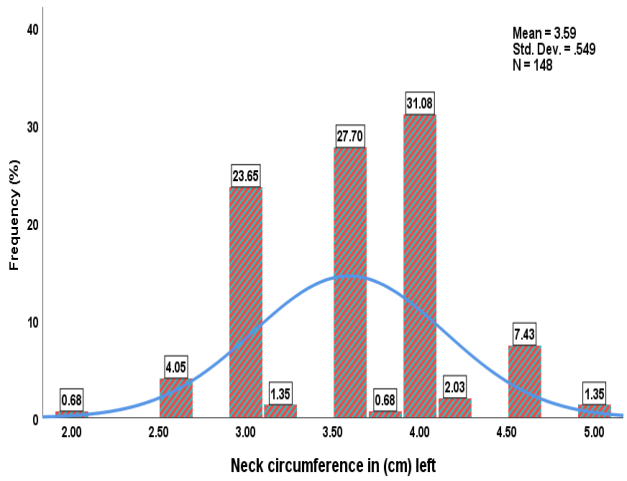

Fig. 3: Histogram showing the frequency distribution of neck circumference of the left fibula

Discussion

Fibula is the slender lateral bone of the leg. The upper end of the fibula gives attachments to ligaments of knee joint but does not form a direct articular component of the knee joint. In present

study, the mean±SD of the neck circumference of the right sided and left sided fibulae were 3.4±0.50 cm and 3.59±0.55 cm respectively. The neck circumference of 152 right sided fibulae ranged between 2.5 cm and 5 cm. More than 91% samples were measured within the range of 3 cm to 4 cm. However, the neck circumference of 148 left sided fibulae ranged between 2 cm and 5 cm. More than 85% samples were measured within the ranged of 3 cm to 4 cm. The mean values of present study were nearly similar to the study findings of Lingamdenne (2019) in an Indian population, as the mean neck circumference of both sided fibulae was observed 3.39±50 cm (ranging between 2.60 cm and 4.70 cm).[3] Osteometric measurements of different parts of the fibula, particularly the proximal fibula are used to determine the sex of the bone, and understanding stability of the knee joint and human kinetics in sport science and physical education.[3-6]

Conclusion

The mean neck circumference of the right and left sided fibulae were found 3.4±0.50 cm and 3.59±0.55 cm respectively. Our data is expected to enrich the information pool for the general physicians, orthopaedic surgeons, forensic specalists and anthropologists to improve their knowledge and understanding regarding various anatomical parameters of human fibula.

References

1. *Singh V. Textbook of Anatomy. Abdomen and lower limb. 2nd ed. New Delhi: Elsevier India; 2014.*
2. *Moore KL, Dalley AF, Agur AMR. Lower limb. In: Clinically Oriented Anatomy. 7th ed. Baltimore, MA: Lippincott Williams & Wilkins; 2014.*
3. *Lingamdenne PE. Evaluation of osteometric parameters of fibula and talar facet morphometry in Telangana region. Indian J Clin Anat Physiol. 2019;6(4):497-502*
4. *Savka IG. Forensic morphological signs characterizing stability of the femur, tibia and fibula during effect of external destructive load. Wiad Lek. 2019;72(2):198-200.*
5. *Wang X, Wei L, Lv Z, Zhao B, Duan Z, et al. Proximal fibular osteotomy: a new surgery for pain relief and improvement of joint function in patients with knee osteoarthritis. J Int Med Res. 2017;45(1):282-9.*
6. *Naidoo N, Ishwarkumar S, Lazarus L, Pillay P, Satyapal KS. Osteometry and morphology of the human fibula: a South African study. Int J Morphol. 2015;33(3):1071-7.*