Original Article

The Asymmetry in Weight Between the Right and Left Human Humerus of Bangladeshi Population

Haque S.M.A[1], Mehataz T.[2], Hasan M.R[3], Pervin S.[4], Biswas T.R.[5], Khanam S.R[6], Debnath D.[7], Debnath D[8].

Abstract

The present investigation aimed to study the phenomenon of asymmetry in weight between the right and left human humerus of the Bangladeshi population. This cross-sectional, descriptive study was done on 100 (43 right and 57 left) fully ossified dry human humeri in the Department of Anatomy, Mymensingh Medical College, Bangladesh, between July 2021 and June 2022. A non-random, purposive sampling technique was adopted. The weight of the humerus was measured using a digital weighing machine. The mean (±SD) weight of the right humerus was 91.067 (±26.944) gm, and the left humerus was 93.970 (±32.227) gm.

The objectives of this study were to determine the weight of the human humerus in the Bangladeshi population and to compare these findings with data from other populations for use in anatomy, forensic, and archaeological studies.

Keywords: Human humerus, asymmetry, weight, Bangladeshi population

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1. Shah Md. Atiqul Haque, Assistant Professor, Department of Anatomy, Mymensingh Medical College, Mymensingh, Bangladesh.

2. Tasnova Mehataz, Indoor Medical Officer, Department of Anaesthesiology, Community Based Medical College Hospital, Bangladesh, Mymensingh.

3. Mohammad Rajibul Hasan, Associate Professor, Department of Anaesthesiology, Community Based Medical College Bangladesh, Mymensingh.

4. Suraiya Pervin, Assistant Professor, Department of Physiology, Prime Medical College, Rangpur, Bangladesh.

5. Tithi Rani Biswas, Assistant Professor, Department of Anatomy, Army Medical College, Jashore, Bangladesh.

6. Sultana Razia Khanam, Assistant Professor and Head, Department of Orthodontics and Dentofacial Orthopaedics, Community Based Medical College Bangladesh, Dental Unit, Mymensingh.

7. Debshree Debnath, Medical Officer, Department of Dermatology and Venerology, Mymensingh Medical College Hospital, Mymensingh, Bangladesh

8. Dhrubajit Debnath, Lecturer, Department of Anatomy, Mymensingh Medical College, Mymensingh, Bangladesh.

***Corresponding Author**:

Shah Md. Atiqul Haque, Assistant Professor, Department of Anatomy, Mymensingh Medical College, Mymensingh, Bangladesh. Mobile No: 01717110314, Email: dr.rony13@gmail.com

Introduction

Symmetry refers to the correspondence in size, weight, shape, and relative position of parts on opposite sides of a median dividing plane, whereas asymmetry denotes the absence or lack of such correspondence. While humans generally exhibit bilateral symmetry in paired morphological traits, notable deviations occur in all internal organs, the brain, and particularly the upper extremities- a phenomenon known as bilateral asymmetry[1]. Bilateral bone asymmetry is believed to arise from uneven mechanical stress, which affects bone remodeling and plasticity[2,3].

The humerus, the longest and thickest bone of the upper limb, forms the skeletal framework of the arm, connecting the shoulder and elbow joints[4,5]. Determining the mean weight of humerus segments is important in both anatomical and forensic contexts, aiding investigators in establishing the identity of skeletal remains.

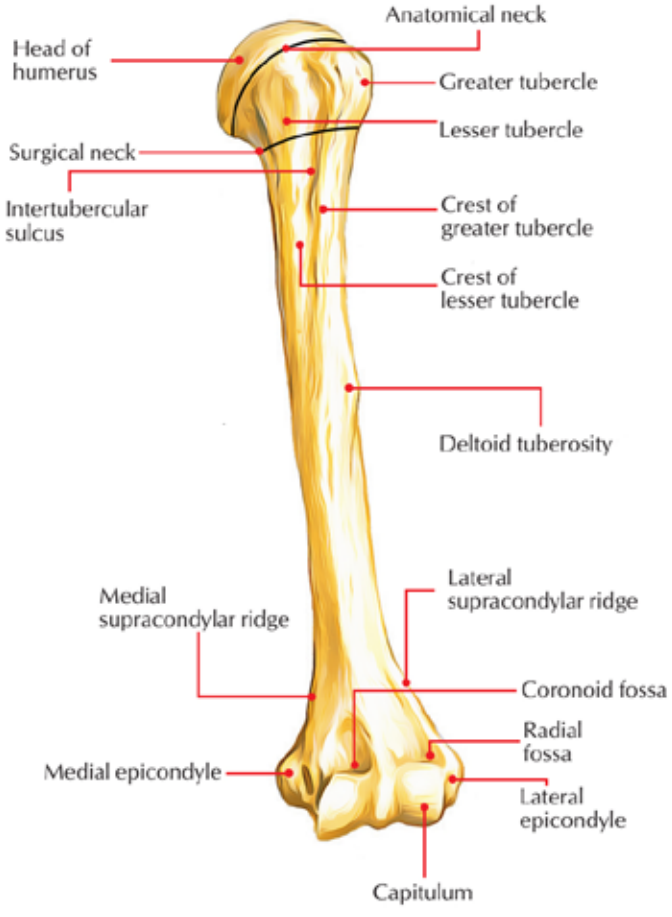

Figure 1: Human Humerus

Methods

The study was conducted from July 2021 to June 2022 in the Department of Anatomy, Mymensingh Medical College, Mymensingh, Bangladesh. Samples were obtained from the same department. A total of 100 fully ossified dry human humeri were included in this cross-sectional descriptive study. A non-random, purposive sampling technique was applied for sample selection. Bones that were unossified, developmentally abnormal, or broken were excluded. The weight of each humerus was measured using a digital weighing machine. For measurement, the specimen was placed on the weighing platform, and the reading displayed was recorded in grams.

Figure 2: Photograph Showing the Procedure of Measurement of Weight of the Right Humerus

Figure 3: Photograph Showing the Procedure of Measurement of Weight of the Left Humerus

Results

The mean (±SD) weight of the humerus was 91.067 ± 26.944 g on the right side and 93.970 ± 32.227 g on the left side. The weight of the 43 right humeri ranged from 40 g to 139 g, with more than 83% falling within the range of 61–131 g. The weight of the 57 left humeri ranged from 33 g to 164 g, with more than 80% falling within the range of 63–150 g.

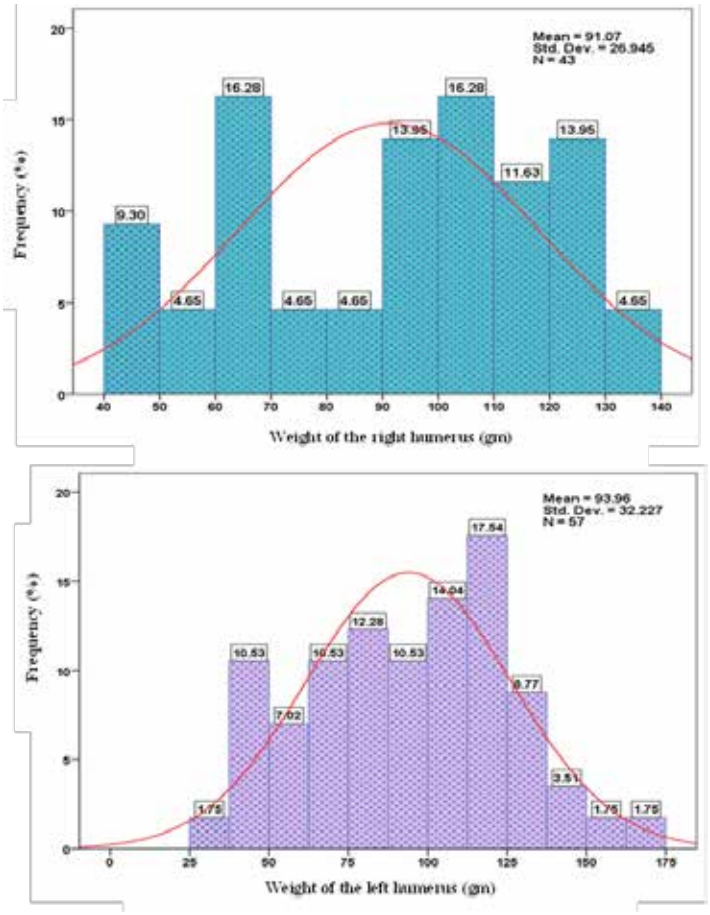

Figure 4: Histogram Showing the Frequency Distribution of Weight on Both Sided Humerus

Discussion

According to the present study, the mean (±SD) weight of the right humerus was 91.067 ± 26.944 g, while that of the left humerus was 93.970 ± 32.227 g.

Niraj, Dangol, and Ranjit (2013)[6] studied 200 humeri (100 right and 100 left) and reported a mean ± SD weight of 122.26 ± 16.81 g for the right humerus and 118.47 ± 15.81 g for the left.

Similarly, Kabakci et al. (2017)[7] examined 60 humeri (28 right and 32 left) and found mean ± SD weights of 115.05 ± 28.06 g for the right humerus and 111.63 ± 33.34 g for the left.

The mean values for both sides in the present study were lower than those reported by Niraj, Dangol, and Ranjit (2013)[6] as well as Kabakci et al. (2017)[7].

Conclusion

In the present study, the weight of the human humerus was measured on both the right and left sides. The observed differences can be attributed to several factors, including race, personal habits, and genetic influences. The findings of this study will contribute valuable reference data for future research aimed at establishing baseline values from a Bangladeshi perspective and may serve as a useful tool in the fields of forensic medicine, anthropology, orthopedics, and anatomy.

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