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ANALYSE THE DIFFERENTIATION IN THE LENGTHS OF HUMERUS FOR SEXUAL DIMORPHISM

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Abstract
Background: Acute appendicitis (AA) is one of the most common surgical emergencies. Apart from increased utilization of imaging diagnostic facilities and laboratory test. Thus, Alvarado score WBC cell count and serum CRP was carried to study AA in different age groups. **Materials and Methods:** 207 patients of different age group were categorised in 3 different groups based on Alvarado score Group-I score between 7-10, group-II 4-6, group-Less than 3, CRP estimation and complete blood count (CBC) was done and PPV, NPV was studied for confirmation of AA. **Result:** 131 patients were in category I and 107 (51.1) were confirmed as AA, 86 was PPV of elevated CRP 35 was NPV of normal CRP, 69 patients were in category II and 35 (16.9%) were confirmed as AA, 62 was PPV of elevated CRP and 70 was NPV of normal CRP, 7 patients were in category, III of Alvarado score 2 (0.96%) were confirmed as AA, 32 was PPV of elevated CRP, 84 was NPV of normal CRP. In group-I – 70 (33.8%) had Normal WBC count, group-II 170 (51.6%) had high WBC count (10-15x109x1) and group-III 30 (14.4%) had very high WBC count (>15x109x1) and combined inflammatory variables of WBC and CRP had 100% sensitivity and 89.5% specificity. **Conclusion:** This pragmatic study will be helpful for confirmation of AA in different age group and to prevent morbidity and mortality in complicated AA patients.

INTRODUCTION

The determination of sex is an essential part of any human skeletal examination. Observing morphological characteristics in a full human skeleton allows for straightforward sex estimation.[1] When the entire skeleton is accessible, accurate sex diagnosis should be straightforward; but, when only a portion of the skeleton is available, assessment becomes increasingly difficult.[2] When skeletal remains are discovered, anthropologists attempt to reconstruct the person's biological profile, which includes estimating sex, age, and height.[3] Because subsequent methods of age and stature determination are largely sex dependent, determining sex is one of the earliest and most basic aspects of assessment.[4] The pelvic girdle, skull, and long bones are the major anatomical regions utilised to determine sex. The pelvis, skull, or other anatomical elements that point to reasonably precise sex judgments are frequently missing. As a result, parameters for other bones, particularly long bones that are frequently discovered in the collection must be developed.[5]

Though it has sometimes exhibited even greater accuracy than other long bones such as the femur, the humerus has rarely been used as a location for sex determination.[6] The major goal of this study was to see if humeral measures could be used as a reliable sex indicator and to create baseline values for sexual dimorphism in the humerus in the North Indian population.

The Humerus is the longest and largest bone in the upper extremity, and its outlines can only be felt indistinctly except in its distal quarter since it is almost totally covered by arm muscles.

The main objective of the present study is to analyse the differentiation in the lengths of humerus for sexual dimorphism.

MATERIALS AND METHODS

The current research a morphometric analysis of 250 humerii of unknown sex was performed to evaluate sexual dimorphism, with 145 male and 105 female bones discovered in the current study. The bones had been gathered from dissected cadavers and were already in the Department. Surabhi Institute of

185

Medical Sciences, and the Department of Anatomy, Index Medical College and Research Centre, Indore, for this study (MP). The institutional ethical approval was granted by the Ethical Committee of Index Medical College, Hospital & Research Centre, Indore.

Following Material and anthropometric instruments like
1. Dry humerus
2. Ruler
3. Goniometer
4. Digital calliper
5. Osteometric board
6. Pencil
7. Protactor

The following parameters were taken:
1. Maximum Length of humerus:
It's the distance between the most superior point on the humerus head and the most inferior point on the trochlea in straight lines.
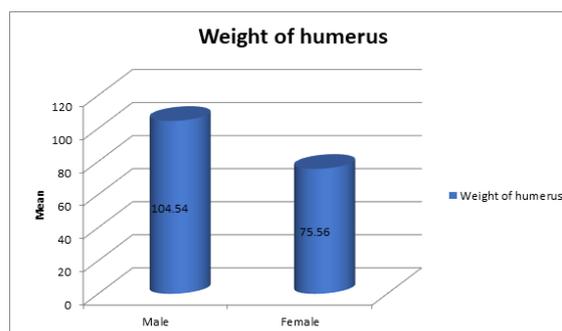
2. Weight of humerus:
The weight of each dried humerus is measured using a scientific balance and weight, and it is expressed in grammes.
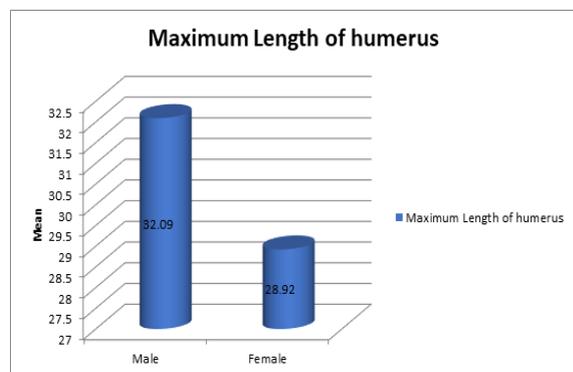
RESULTS

Statistical analyzes projected that the maximum Length of humerus found to be significantly. This was observed that the average (Mean ± SD) was found in male 32.09 ± 1.59 and in female 28.92 ± 1.38. The maximum Length of humerus was found significantly higher in male comparison to that in the female, with a p value of < 0.001.

Table 1: Comparison of maximum Length of humerus

Variable	Male (cm)	Female (cm)	p – Value
	Mean ± SD	Mean ± SD	
Maximum Length of humerus	32.09 ± 1.59	28.92 ± 1.38	0.001

SD = Standard deviation

Figure 1: represents the maximum Length of humerus in the form of bar diagram.

Statistical analyzes projected that the weight of humerus found to be significantly. This was observed that the average (Mean ± SD) was found in male 104.54 ± 17 and in female 75.56 ± 13.35. The weight of humerus was found significantly higher in male comparison to that in the female, with a p value of < 0.001.

Table 2: Comparison of weight of humerus

Variable	Male (gm)	Female (gm)	p – Value
	Mean ± SD	Mean ± SD	
Weight of humerus	104.54 ± 17	75.56 ± 13.35	0.001

SD = Standard deviation

Figure 2: represents the weight of humerus in the form of bar diagram.

DISCUSSION

The average (Mean ± SD) of maximum Length of humerus and weight of humerus was found significantly higher in male comparison to that in the female, with a p value of < 0.001. These findings were in line with the findings of prior research conducted by Vaishnani et al (2019),[7] Ahmed et al (2018),[8] Reddy et al (2017),[9] and Lokanadham et al (2013),[10] investigated that the role of multivariate analysis of humerus metric factors in adult male and female humerus sex distinction. The maximum Length of humerus and weight of humerus, were the most discriminating variables in stepwise analysis, with a total accuracy of 98.1 percent in males and 95 percent in females. They concluded that the present study exhibited better classification accuracy for multiple variables than single variables, and the most discriminating variables in stepwise analysis are the maximum Length of humerus and weight of humerus, was the single most relevant variable in direct analysis.

CONCLUSION

The current study clearly shows that males have substantially higher statistical values for all parameters when compared to females. This research highlights the need of population-specific methodologies not only for medicolegal investigations, but also for the study of population affinities and variables influencing bone shapes.

When other human remains suitable for sex determination are unavailable, the study's findings may aid in predicting sex from the humerus in Indians.

REFERENCES

1. Ogedengbe OO, Ajayi SA, Komolafe OA, Zaw AK, Naidu ECS, Okpara Azu O. Sex determination using humeral dimensions in a sample from KwaZulu-Natal: an osteometric study. Anat Cell Biol. 2017;50(3):180-186. doi: 10.5115/acb.2017.50.3.180.
2. Kranioti EF, Michalodimitrakis M. Sexual dimorphism of the humerus in contemporary Cretans--a population-specific study and a review of the literature*. J Forensic Sci. 2009;54(5):996-1000. doi: 10.1111/j.1556-4029.2009.01103.x.
3. Dibennardo R, Taylor JV. Classification and misclassification in sexing the Black femur by discriminant function analysis. Am J Phys Anthropol. 1982;58(2):145-51. doi: 10.1002/ajpa.1330580206.
4. Ross AH, Manneschi MJ. New identification criteria for the Chilean population: Estimation of sex and stature. Forensic Sci Int. 2011;204(1-3):206.e1-3. doi: 10.1016/j.forsciint.2010.07.028.
5. Ross AH, Manneschi MJ. New identification criteria for the Chilean population: Estimation of sex and stature. Forensic Sci Int. 2011;204(1-3):206.e1-3. doi: 10.1016/j.forsciint.2010.07.028.
6. Lee UY, Kim IB, Kwak DS. Sex determination using discriminant analysis of upper and lower extremity bones: New approach using the volume and surface area of digital model. Forensic Sci Int. 2015;253:135.e1-4. doi: 10.1016/j.forsciint.2015.05.017.
7. Robinson MS, Bidmos MA. The skull and humerus in the determination of sex: reliability of discriminant function equations. Forensic Sci Int. 2009;186(1-3):86.e1-5. doi: 10.1016/j.forsciint.2009.01.003.
8. Mall G, Hubig M, Büttner A, Kuznik J, Penning R, Graw M. Sex determination and estimation of stature from the long bones of the arm. Forensic Sci Int. 2001;117(1-2):23-30. doi: 10.1016/s0379-0738(00)00445-x.
9. Reddy BB and Doshi MA. Sex determination from adult human humerus by discriminant function analysis. Int J Res Med Sci. 2017;5(9):3891-97.
10. Lokanadham S, Khaleel N, Raj PA. Morphometric analysis of Humerus bone in Indian population. Sch J App Med Sci. 2013;1(4):288-290.

187

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