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SEXUAL DIMORPHISM OF FEMUR BY FEMORAL LENGTH IN COASTAL AREAS OF KARNATAKA.

Anatomy

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ABSTRACT

Introduction: - Sex determination is relatively easy if the entire skeleton is available, pelvis and skull are the most reliable bones for this purpose. However, in medico-legal cases one does not always have a complete pelvis or skull. Therefore it is important to be able to assess sex from the other parts of the skeleton also. Sexual dimorphism of maximum length of femur is studied by several workers in different populations.

Aim: - The purpose of the study is to analyze sexual dimorphism of femoral length in populations of coastal areas of Karnataka.

Materials and methods: - Material for the present study consisted of 100 male (50 of right & 50 of left side) and 100 female (50 of right & 50 of left side) human adult femora from the skeletal collection of Anatomy department, from Karwar Institute of Medical Sciences, Karwar.

Results: - After obtaining all measurements unpaired't-test'was performed. It shows statistically significant sex difference.

Conclusion: - The present study is very helpful for the sex difference of femur in populations of coastal areas of Karnataka.

KEYWORDS

Human femur, femoral length coastal areas of Karnataka.

Introduction:

The determination of sex from skeletal remains is immensely important medico-legally as well as anthropologically. Sex determination is relatively easy if the entire skeleton is available, pelvis and skull are the most reliable bones for this purpose[1]. However, in medico-legal cases one does not always have a complete pelvis or skull[2]. Therefore it is important to be able to assess sex from the other parts of the skeleton also. Sexual dimorphism of maximum length of femur is studied by several workers in different populations. So present study was carried out to ascertain sexual dimorphism of maximum femoral length in populations of coastal areas of Karnataka.

MATERIALAND METHODS

Material for the present study consisted of 100 male (50 of right & 50 of left side) and 100 female (50 of right & 50 of left side) human adult femora from the skeletal collection of Anatomy department, from Karwar Institute of Medical Sciences, Karwar. Maximum length was measured with Femur on Osteometric board in such a manner that medial condyle touches the short vertical wall; the moveable cross piece should touch the highest point of the head. Maximum vertical distance between upper end of head of femur and the lowest point on femoral condyle was measured. Each bone was measured thrice and measurement was repeated by two independent observers, mean of these observations was taken as a final reading to nullify any intra and inter-observer error. Data collected was tabulated and analyzed statistically sidewise & sex wise.

RESULTS

Right femur: The maximum length of right male femur varied from 380mm to 490mm (Mean: 435 & S.D.: 21.88) and of right female femur varied from 350mm to 440mm (Mean: 395 & S.D.: 18.28). Mean value of maximum length was higher in male as compared to female. Calculated t-value and P value showed that the difference in the mean maximum length in male and female was statistically highly significant with P<0.001. Left femur: The maximum length of left male femur varied from 381mm to 493 mm (Mean: 437 & S.D.: 21.98) and of left female femur varied from 352mm to 440mm (Mean: 396 & S.D.: 18.35). Mean value of maximum length was higher in male as compared to female. Calculated t-value and P value showed that the difference in the mean maximum length in male and female was highly statistically significant with P<0.001. Differences in the value between right & left male and right & left female were not statistically significant, so were not evaluated further.

DISCUSSION

Mean value of maximum length was higher in male as compared to female. Calculated t-value and P value showed that the difference in the mean maximum length in male and female was highly statistically significant with P<0.001 on both side. Based on the calculated range, we can statistically fix a measurement above which no female bone can be found and another measurement below which no male femora can be seen

Dimensionally the adult male: female ratio is about 100: 92, i.e. female measurements are about 92% of male measurements, this does not precisely hold for the entire living body. Generally male bones are longer and massive and this difference is reflected by the greater values of the mean maximum femoral length in male on both the sides. Comparison of maximum femoral length of male between present study and other studies.

Mean maximum femoral length in present study was lower than the American Blacks[3] & South African Whites[4]; was higher than the Chinese[5] & Thai[6] & femora and it correspond with the value seen in American Whites. While mean maximum female femoral length in present study was lower than the American Blacks & South African Whites; was higher than the Thai, Chinese and was similar to the value in American Whites. This difference in mean femoral length in between populations may possibly be a result of factors affecting bone morphology like genetic constitution, diet, nutrition status, environment and physical activity. This could be explained on the basis of statistical method applied. Biological variables may show wide variations, which the simple analysis may not cover even if the sample size is large, this problem can be overcome by subtracting and adding S.D.s to mean value (±3S.D.), these will give the maximum and minimum values the range of which covers 99.75% of population of that area, while percentage of correctly sexed bone dropped down sharply with the statistically calculated.

CONCLUSION

The determination of sex by analyzing the morphological aspects depends on the expert's ability. Mean values of maximum length of normal human adult femora from coastal areas of Karnataka region, in male were 435 mm (Right) & 437 mm (Left) and for female were 395 mm (Right) & 396 mm (Left). This study is very useful for medico-legal cases in the coastal areas of Karnataka.

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