Sex prediction using Fingers Length and Finger Length Ratios of the right hand by X-Ray aid in Fayoum Governorate

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Abstract

Background: Sex identification is one of the most important criterions in the identification of individual identity as; it excludes half the exposed population. The analysis of the skull and the pelvis may frustrate forensic anthropologists to determine sex through it due to its affection by different types of inhumation or physical insults. Human populations exhibit some degree of sexual dimorphism; the length of fingers can determine the possibility of sexual dimorphism in addition to the fingers ratio which depends neither on the body size, height, nor age.

Aim of the work: The present study aims to detect sex by using various parameters (length of the right-hand fingers and the ratio between them) by the aid of X-Ray.

Methods: This study was conducted on 200 Egyptian volunteers (100 males and 100 females), randomly selected 20-35 years old from Fayoum city. All subjects were healthy, had no fracture, disease, amputation or tumours. The mean age of the studied group of the males was 30.88 years while that of the females was 29.72 years old. The length of the bone of the fingers of the right hand of the males and the females was measured using a spreading calibre (the thumb is excluded). The ratio between the right-hand fingers was also measured in the males and the females which were FBL2/FBL3, FBL2/FBL4, FBL2/FBL5, FBL3/FBL4, FBL3/FBL5 and FBL4/FBL5.

Results: The results had proved that the mean length of the male's fingers is more than that of the females and there were a highly statistical difference between them (P-value<0.0001), and the mean length of the females fingers ratio is more than that of the males and there were a significant statistical difference (P-value<0.05) regarding finger ratio except those of FBL4/FBL5. Also, by applying ROC curve there was highly statistical difference between the fingers (P-value<0.0001) regarding the finger length with accuracy >70% and there were a significant statistical difference (P-value<0.05) regarding the finger ratio with accuracy > 60% except those of FBL4/FBL5.

Conclusion: The finger length and the phalangeal length ratio are sexually dimorphic and could precisely predict sex.