H70 Sexual Dimorphism of Index to Ring Finger Ratio in South Indian Children

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After attending this presentation, attendees will be able to recognize index and ring finger ratio as a possible sex indicator in South Indian children.

This presentation will impact the forensic community in the identification of victims from dismembered human remains encountered in cases of mass disasters and explosions, and assault cases where the body is dismembered to conceal the identity of the victim. When an individual hand is recovered and brought for examination, index and ring finger ratio may prove to be a useful tool for sex determination of the dismembered remains.

Definitive sexual traits are not manifested until after the full development of secondary sexual characters that appear during puberty. Thus sex determination from prepubertal human remains is a challenge for forensic experts and physical anthropologists worldwide. The research was undertaken to investigate sexual dimorphism of the index and ring finger ratio in South Indian children.

The study was conducted on 350 children (175 males and 175 females) of South Indian origin aged 12 years and below at Manipal in coastal Karnataka, South India. The index finger length (IFL) and the ring finger length (RFL) were measured in millimeters in each hand. The distance between the mid point of the proximal most flexion crease at the base, and the most forward placed point (tip) of each finger in the midline on the ventral (palmar) surface were recorded for each hand. The index and ring finger ratio was computed by dividing index finger length by ring finger length. The data obtained were analyzed statistically using SPSS (Statistical Package for Social Sciences, version 10.0) computer software. Student's t-test was performed to compare the index and the ring finger lengths and the ratio in the two hands, and between both sexes; a p-value ≤ 0.05 was considered as significant.

Mean IFL and RFL values were significantly higher in males for both hands. Difference in mean RFL between males and females was, however, more than the difference in mean IFL in both hands. In all the hands that were examined, mean RFL was greater than mean IFL in both males and females. Index and ring finger ratio derived from the finger lengths ranged from 0.89 to 1.02 in males with a mean of 0.9500, and from 0.90 to 1.06 with a mean of 0.9887 in females for the right hand. For the left hand, the index and ring finger ratio ranged from 0.89 to 1.02 in males with a mean of 0.9488, and from 0.90 to 1.06 with a mean of 0.9864 in females. The derived ratio showed a statistically significant difference between males and females ($p < 0.001$). The index and ring finger ratio did not show any significant differences between the two hands in males and females.

The study reveals that the index and ring finger ratio shows sexual dimorphism in the South Indian children and thus may prove useful to determine the sex of an isolated hand when it is submitted for medicolegal examination. The index and ring finger ratio is found to be higher in females when compared to their male counterparts in both hands. The study suggests that ratio of 0.9700 and less is suggestive of male sex for both hands, while a ratio of more than 0.9700 is suggestive that the hand is of female origin. Similar studies are proposed to confirm the findings of our study and find if sexual dimorphism in the index to ring finger ratio is a constant feature in other population and age groups.

Forensic Anthropology, Sex Determination, Index to Ring Finger Ratio

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