

Estimation of Sex from Hand Dimensions in an Indigenous Karbi Adult Population of Assam, India

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ABSTRACT Personal identification is one of the most important elements in any medico-legal and forensic investigation. It is a challenging task for both the forensic experts and physical anthropologists when identifications of unknown dismembered remains are involved. The aim and objectives of the present investigation was to determine sex by using hand length (HL) and hand breadth (HB) among an indigenous adult Karbi tribe of Karbi Anglong, Assam, India. The present community based cross-sectional investigation was undertaken among 320 unrelated adult Karbi individuals (160 males;160 females) between the age-group of 20-50 years, using stratified random sampling method. The anthropometric measurements of HL and HB were collected using standard procedures. The statistical analysis of descriptive statistics, ANOVA, binary logistic regression (BLR) and AUC-ROC were performed using SPSS (version 16.0). The results indicate that mean of LHL, RHL, LHB, RHB, LHI and RHI were observed to be significantly higher among men than women ($p < 0.01$). The investigation highlights the existence of sexual dimorphism in HL and HB ($p < 0.01$). The mean bilateral difference was found to be statistically not significant in both sexes in HL and HB ($p > 0.05$). The BLR analysis showed that HB was found to be significantly more associated with sex estimation than the HL in both sexes ($p < 0.01$). The AUC-ROC analysis was performed to test the predictive accuracy in sex estimation after predicting the probability of HL and HB. The AUC-ROC analysis showed that combined HB than HL have more accuracy over a single hand dimension measure (for example, LHL, RHL, LBH and RHB) to determine the sex ($p < 0.01$). The equation of the present investigation may prove to be useful in sex estimation of an adult individual when any fragmented or mutilated body parts are brought for the forensic science and medico-legal investigations.