



Physical Anthropology Section - 2014

H103 Application of Ischium-Pubis Index for Sex Determination Using 3D Models

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This goal of this presentation is to compare the accuracy of three methods to calculate ischium-pubis index. The new method using the deepest point of the acetabulum outperformed the traditional method of the point where the innominates meet.

This presentation will impact the forensic science community by presenting previous studies about ischium-pubis index that reported the method is susceptible to subjectivity, as the landmark in the acetabulum can be varied. As being able to mark the deepest point of the acetabulum through the 3D metric method, sex determination from ischium-pubis index has become an objective way of practicing forensic anthropology.

For sex estimation with the pelvis, ischium-pubis index is commonly chosen along the greater sciatic notch. This index is the percentage value of the pubic length divided by the ischium length and knowing that females have greater value than males. The pubic length is the distance from the upper edge of the pubic symphysis to the acetabulum, and the ischium length is the distance from the most distinct point on the ischial tuberosity to the acetabulum. The point in the acetabulum is customarily marked on the point where the three parts of the pubic bone meet; however, due to irregular shape of the acetabulum, there is a possibility of it being marked differently due to the observer. Thus, a landmark which we studied is more objectively marked and the ischium-pubis index is applicable to the Korean population.

This study focused on 103 sides (52 female and 51 male) of the Digital Korean Database stored in the Catholic Institute for Applied Anatomy. Landmarks chosen near the acetabulum to measure the pubis length and ischium length were: the point where the pubis, the ilium, and the ischium meet; the deepest point of the acetabulum; and a point on the acetabular border. Mimics[®] version 15 was used to enable three-dimensional measurement by a template programmed for this study. There were nine measurement items related to the distance and angle between each point. Discriminant analysis for sex determination was completed by SPSS version 20.0.

The method using the deepest point of the acetabulum showed the highest accuracy of sex estimation compared to the traditional method using the contacting point of the three innominates and another method of upper border of the acetabulum. Therefore, it is suggested through this study that utilizing the deepest point of the acetabulum is suitable for calculating the ischium-pubis index. For this study, the mean ischium-pubis index of males was 98 and of females was 114, and the demarking point of both sexes was 106.

Sex Determination, Ischium-Pubis Index, 3D Models