H91 The Effects of Parturition on the Areas of Interest for Age Assessment on the Pelvis

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After attending this presentation, attendees will understand the need for consideration of parity when assessing the age of the pelvis in a recent forensic sample from the United States, the necessary methods utilized on the pelvis, the process and reasoning behind the collection of data, and subsequent statistical analysis employed in this study.

This presentation will impact the forensic science community by indicating whether parturition effects an accurate assessment of age on the pelvis in a recent forensic sample from the United States and if it needs to be considered as an addition to the methods employed in human identification.

Assessing the age of an adult skeleton is a critical facet in creating the biological profile of an individual. To date, there are different methods used on select elements of the skeleton to assess the age of the individual and, currently, the pelvis is relied upon heavily to obtain accurate and reliable age ranges.1-3 Many have stated that age-related changes follow different trends in males and females, with parity presented as one of the possible causes for such differences.1,4-6 There is reason to believe that parturition may increase the rate at which the areas of interest of the pelvis degenerate. However, this hypothesis has yet to be formally tested on a recent skeletal collection. The purpose of this study is to assess the effects of parturition on the pubic symphysis and auricular surface and determine whether it influences the physiological age of the individual enough to cause an inaccurate estimate of the chronological age.

Data were collected from the William M. Bass Skeletal Collection located at The University of Tennessee, Knoxville. This is a collection of recent forensic skeletons with known age-at-death, ancestry, sex, and medical background. The areas of interest are the pubic symphysis and the auricular surface and were analyzed in accordance with the methods included within Buikstra and Ubelaker's Standards For Data Collection From Human Skeletal Remains as well as methods proposed by Buckberry and Chamberlain and Berg.1,3,7 Therefore, others attempting to replicate this research will be able to reliably assess these areas. Time was designated at the beginning of the second and third days to employ the test-retest method to calculate the intra-observer error rate and ensure reliability of these assessments.

In this study, a statistical comparison was made between females who have given birth and those who have not to determine whether this process affects the rate of degeneration of the areas of interest of the pelvis. A simple linear regression was run to determine the prediction ability of the accurate phase of the pubic symphysis and auricular surface from the individual's age. This was performed for each method of analysis. The results were then compared between the parous and nulliparous groups. In addition, the individuals who were aged incorrectly were analyzed to determine whether there was a pattern of over-estimation unique to the parous group and, if so, whether the over-estimation is enough to cause an inaccurate assessment of the chronological age of the individual.

The study contained 434 individuals (234 males, 200 females, 157 parous, and 43 nulliparous). The data was entered into SPSS computer program version 20.0. A simple linear regression analysis produced significantly different results between parous and nulliparous females using the pubic symphysis but not the auricular surface. The current research suggests that parturition affects the pubic symphysis and not the auricular surface when determining age-at-death at the 95% confidence level. There is some factor that causes the parous females to appear, on average, ~1.5 years older than nulliparous females; however, the slopes of the regression lines indicate that the parous females age more slowly than nulliparous females, who are, on average, aging 2.67 times faster. An analysis of the incorrectly assessed individuals shows that parous females tend to be over-aged when compared to nulliparous females. The applicability of taking parturition into consideration when assessing the age of females for use in human identification in modern forensic cases will be discussed.

References:

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Forensic Anthropology, Age Estimation, Pelvis

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