A55 A Grading System to Assess the Sex and Parity Status for the Preauricular Sulcus

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After attending this presentation, attendees will have a better understanding of the sexual dimorphic variability of the preauricular sulcus in human adult os coxae.

This presentation will impact the forensic science community by providing a grading system for the preauricular sulcus as a sexually dimorphic trait and a musculoskeletal stress marker.

Forensic anthropologists, anatomists, and clinicians have long suggested that pregnancy and parturition may leave a "scar" on the skeleton, especially the os coxae; however, there has been much debate and no clear method for examination has been established. The preauricular sulcus or groove is found on the os coxae between the auricular surface and the greater sciatic notch. It is the site of the attachment for the anterior sacroiliac ligament. During pregnancy, this ligament is loosened in order to widen the birth canal in preparation for parturition; these changes cause remodeling of the bone that can be observed.

The goal of this research was to examine the effects of sexual dimorphism, pregnancy, and parturition on the preauricular sulcus.

Two English medieval skeletal collections were examined in this research, the Poulton collection (sample size=59) and the St. Owens Church Gloucester collection (sample size=108) both housed at Liverpool John Moores University. The skeletal material has been aged and sexed using multiple established methods and compared through inter-observer error with the estimations produced by other forensic anthropologists.

A grading system was designed to examine the different types of sulcus, which was evaluated to range from Grade 0 to Grade 4: (1) Grade 0 — no preauricular sulcus present; (2) Grade 1 — a preauricular sulcus that is shallow and the floor of the sulcus has a uniform depth; there are no pits or grooves and the edges are often undefined. This grade is often scarcely visible, which can make the measurements difficult, as there are usually no definite edges; (3) Grade 2 — a preauricular sulcus whose floor has a slightly uneven depth and is not completely smooth. There should only be a small change in depth; however, a preauricular sulcus with more than one pit of different depths would instead be classified as a Grade 3; (4) Grade 3 — this Grade, although similar to Grade 2, differs as the floor of the sulcu has multiple varying depths and will have more than one pit. Grade 3 has a more defined edge than Grades 1 and 2; and, (5) Grade 4 — a preauricular sulcus whose floor has a very inconsistent depth; it will have multiple deep pits or channels through the sulcus. The surface of the sulcus will appear rough and is very easy to observe on the bone. Unlike Grade 1 preauricular sulcus, it would be difficult to overlook. Grade 4 typically looks like a deep channel in the bone.

For this research, each os coxae was individually graded. In addition, the maximum length and width of the sulcus was recorded, along with the sex of the individual. The data from the two collections were combined. The results showed a significant difference in the occurrence rates of the preauricular sulcus in males and females, demonstrating the value of this characteristic as a sexual indicator. A preauricular sulcus was present in 91.3% of females and not present in only 8.8%, while for males, preauricular sulci was only present in 39.5% of cases and are not present in the majority, 60.5%. The research also suggests that pregnancy and parturition does leave a mark on the sulcus. No Grades 3 or 4 sulci, which were suggested to be indicators of pregnancy and parturition, were found in males. They were only found in females that could have been parous, as 47.5% of females had Grade 3 and 8.8% had Grade 4. To verify this method, the proposed scoring system will be tested in the future on additional skeletal collections

According to the trend of modern forensic sciences, which are looking for valid and reliable methods, this study proposes a new scoring system to evaluate the morphology of the preauricular sulcus in relation to sex and possible parity status.

Sexual Dimorphism, Preauricular Sulcus, Pregnancy

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