A78 Assessing the Effects of Pregnancy on Aging From the Pubic Symphysis: Incorporating Living People Into Biological Profile Research by Combining Medical Imaging and Participant Interviews

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After attending this presentation, attendees will gain an increased understanding of the effect of pregnancy on the face of the female os pubis and its impact on aging accuracy as well as a practical introduction to the value and implementation of living patients in biological profile research.

This presentation will impact the forensic science community by introducing a novel means of future data collection combining medical imaging technology and patient observation and interviews.

One of the major restricting factors in biological profile research continues to be the limited availability of data representing current populations. Each year, historical collections become further removed in diet, activity, environment, and general lifestyle from the people of today, prompting an increasing shift to skeletal material that has been generously donated, sanctioned for study after conflict, or collected during autopsy. By incorporating the medical imaging of living volunteers, this study sought to investigate an additional methodology for modern data collection that allowed for both unlimited sample size and the inclusion of life history information provided first-hand by the subjects themselves.

Anecdotal evidence has long associated pregnancy with the difficulty and disproportioned inaccuracy of aging from the face of the female os pubis. However, as previous studies have exclusively utilized physical postmortem specimens (mainly from autopsy), both lifestyle and birth history information has been basic and of debatable accuracy (as, by necessity, it was/is gathered from secondary and tertiary sources such as medical records and/or family and friends). Perhaps as a result, in the absence of a solution, publications moved away from examinations into pregnancy and parturition and into so-called "what" investigations such as methods comparisons, 3D surface mapping, advocating for a 7th phase, and the creation of new equations for narrowing age-at-death to smaller, more specific ranges. In setting living participants as its data set, this study sought to focus more on the "why" of symphyseal change than on the "what."

By working within Britain's National Healthcare System (NHS) and Oxford University Hospital's system (OUH), for this study, access was obtained to any and all patients coming into radiology for scans involving the pubic symphysis (approximately 40-50 per day). Questionnaires detailing demographics and body type, diet, activity level, sports history, and smoking and alcohol consumption were then completed by both sexes, with an additional pregnancy history page given to females. All participants then signed consent for both their scan(s) and questionnaires to be included as part of this project. The scans were 3D volume rendered and a modification to the *Suchey-Brooks Method for Aging the Os Pubis* was applied by the both a person familiar with this study and three independent observers (blindly) to determine whether male, nulliparous females, and parous females could be distinguished from each other with any significant reliability. Additional patterns between life history and symphyseal change were also investigated.

While pregnancy and the pubic symphysis was chosen to illustrate this methodology, it is by no means the only application — utilizing the data of living subjects, coupled with participant observation and patient interviews, lends itself equally to more complex investigations such as the effect of substance abuse on over-aging or the effect of environment (both social and physical) on inter- and intra-population variation. Therefore, in addition to insights into the effects of pregnancy on the reliability of aging accuracy, attendees of this presentation will be walked through the process of setting up partnerships with local hospitals, gain a basic knowledge of the different imaging modalities and their current uses, and receive an introduction to volume rendering as well as some of the software currently available.

Pregnancy, Pubic Symphysis, Medical Imaging