A16 An Examination of Pelvic Scarring as a Determinant of Parturition Status

Helen M. Brandt, BA, University of Indianapolis, 1400 E Hanna Avenue, Indianapolis, IN 46227; Stephen P. Nawrocki, PhD, University of Indianapolis, Dept of Biology, 1400 E Hanna Avenue, Indianapolis, IN 46227-3697; and Krista E. Latham, PhD, University of Indianapolis, Dept of Biology, 1400 E Hanna Avenue, Indianapolis, IN 46227*

The goals of this presentation are to: (1) develop a better understanding of the effects of parity and sex on pelvic bone scarring; and, (2) recognize the significant causal relationship between childbirth and dorsal pubic pitting.

This presentation will impact the forensic science community by providing a statistically rigorous study of pelvic scarring using a large modern skeletal sample and controlling for other relevant independent variables. This study helps to resolve the contradictory findings of prior studies, provides new guidelines for the determination of sex and parity from pelvic scars, and establishes a platform for future research on the processes that cause those scars.

Scars of parturition, or pelvic scars, have been examined frequently to explore their utility as indicators of childbirth and sex. Many studies found a significant association between the presence and/or severity of pelvic scars and parity, while others found no such relationship. The traits commonly considered to be indicators of parity are dorsal pubic pitting, the height of the pubic tubercle, the preauricular sulcus, and the interosseous groove. The goal of this current study is to examine these traits in a sample with known parity status, combining traditional qualitative scoring with quantitative measurements and using multivariate testing to separate the influence of parity from other independent variables. The null hypothesis is that parity does not independently affect the expression of pelvic scarring when sex, body size, and age at death are controlled.

Both male and female skeletons were assessed for the presence and degree of pelvic scarring. A sample of 530 identified, primarily Euroamerican individuals was drawn from the Texas State University Donated Skeletal Collection, the Maxwell Museum Documented Skeletal Collection, and the William M. Bass Donated Skeletal Collection. Sex, age at death, and ancestry was recorded for all specimens, and all females had known (self-reported) parity status. Coxa height was used as an indicator of overall body size. The presence and severity of dorsal pubic pitting, the preauricular sulcus, and the interosseous groove were scored traditionally using ordinal scales, and the width, depth, and length of pubic and preauricular pits were also measured with sliding calipers. The type of preauricular sulcus and interosseous groove present ("groove of pregnancy" or "groove of ligament") was recorded. The height of the pubic tubercle was measured using a contour gauge and sliding calipers, and retroauricular surface rugosity was scored ordinally to assess whether this area is also affected by childbirth.

Each of the examined pelvic traits was analyzed individually for its relationship to parity using IBM® Statistical Package for the Social Sciences (SPSS) Advanced Statistics 23.0. The independent effects of sex, age at death, and body size were assessed with binary logistic and ordinal regression for the non-metric traits and analysis of covariance for the metric traits. These powerful multivariate tests allow for a more reliable and precise interpretation of the effects of parity than has been attempted by previous works.

The results clearly demonstrate that only dorsal pubic pitting (presence, number, width, and volume) has a significant relationship with parity. Nulliparous females display a higher frequency of pitting than males, and the number and severity of pits increases in females with the number of births; however, parity's influence on pubic scarring is not as important as that of sex. Females with pitting are ~85% likely to have had at least one child, but females without pitting are only ~30% likely to be nulliparous. The preauricular sulcus and interosseous groove are strongly determined by sex and thus can serve as effective sex indicators, while variance in the height of the pubic tubercle can be attributed to body size and sexual dimorphism. The retroauricular surface increases in rugosity with age and body size and is more rugose in females, but is not influenced by parity.

These results challenge recent arguments for the lack of a causal relationship between dorsal pubic pitting and parity; however, because the effect of parity is secondary to that of sex, the practical applications for determining parity status from an unidentified decedent are limited. Furthermore, these results reinforce claims that the preauricular sulcus, interosseous groove, and pubic tubercle are caused or influenced by processes other than childbirth. All pelvic scars can be used effectively for sex determination.

Forensic Anthropology, Scars of Parturition, Dorsal Pubic Pitting

*Presenting Author