

Cranial Suture Closure and its Relationship to the Estimation of Age: A Re-Evaluation of the Todd & Lyon Method

Rachel E. Voss

Faculty: Peer H. Moore-Jansen

Department of Anthropology, Fairmount College of Liberal Arts and Sciences

The proficiency of adult human identification by means of age estimation based on skeletal remains is indispensable, and frequently call for anthropological methods including but not limited to the estimating of age. Past research reports on the collective use of different techniques to better achieve the most accurate assessment of a person's age, including observations of cranial suture closure to estimate age. A commonly used and yet regularly criticized method by Todd and Lyon (1925) using the crania from the Todd-Hamann collection in Cleveland, Ohio, is based on the observation of developmental phases of "commencement" and "termination" at 16 positions along 3 major cranial vault sutures (coronal, sagittal, and lambdoidal). Sutures are scored on a rating scale of 0-4, ranging from open to fully closed. The purpose of this study is to evaluate the reliability of the Todd (1925) method when applied to a sample of mid-late 19th century and early 20th century (date-of-death) white male crania (n=292) from the William M. Bass Collection housed at the University of Tennessee-Knoxville. The collection is comprised of individuals with known age-at-deaths against which estimated age-at-death is used to re-evaluate the Todd and Lyon (1925) method and its application beyond the original geographical region(s) and temporal association of the Hamann-Todd collection.

This presentation discusses the viability of establishing a more consistent suture closure standard for estimating age using minor adjustments from that the existing application by Todd and Lyon (1925). Our results based on mean suture scores identifies the coronal suture as the most accurate of the three major vault sutures at 85% accuracy. This is followed by a lesser accuracy observed in the sagittal suture (42%), and the lambdoid suture (55%). To further elucidate further the potential relationship between suture closure and individual age, the data were subdivided into six age groups (18-39, 40-49, 50-59, 60-69, 70-79, 80-99). To facilitate the greater age distribution of the present study, age groups used here are modified from Todd and Lyon whose study did not include individuals above age 50 years. Our findings show noticeable differences in suture closure as reflected in coronal suture, which is the most accurate for most age groups, with 63% accuracy for the youngest age group (18-39) and between 70-91% for age group ranging between 40-99 years. The sagittal suture exhibited a correct age estimate at 50% or less in all age group. The lambdoid suture was ranged between 46-64% across different age groups.