



Physical Anthropology Section – 2005

H69 A Test of Four Macroscopic Methods for Age Estimation of Human Skeletal Remains (Lamendin, Lovejoy Auricular Surface, Iscan, Suchey-Brooks)

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The goal of this presentation is to show how to combine the Lamendin, Lovejoy, Iscan, and Suchey-Brooks methods for age estimation.

This presentation will impact the forensic community and/or humanity by demonstrating how macroscopic methods for age estimation are well-known but they are not often compared. Forensic anthropologists may be interested to have a comparison of those four methods on the Terry collection

Age estimation at death of human skeletal remains or non-identified bodies is a difficult task in forensic practice, because no method has proven to be both accurate and simple. Four macroscopic indicators for age estimation were tested and compared (pubic symphyseal face, auricular surface, sternal end of fourth rib, translucency of the tooth and periodontosis).

Method: This study compares the accuracy of those four methods when applied to the Terry collection housed at the Smithsonian's National Museum of Natural History. The sample consists of 210 individuals with a balanced number of males and females, and black and white subjects, ranging in age from 25 to 90 years. For the pubic symphysis the authors use the Suchey-Brooks method (SB), for the auricular surface the Lovejoy method (LJ), for the ribs the Iscan (IC) method and for the teeth, the Lamendin method (LM). Each of the indicators was applied with complete independence from all others. For this reason, pubic symphyseal faces were covered during auricular aging. Bias, inaccuracy, and the intraclass correlation coefficient (ICC) was calculated which assesses similarity and proximity between quantitative data.

Results: The inaccuracy was for each method and all ages (mean +/- standard deviation) as follows: IC 10 +/- 8.6 years, SB 10.7 +/- 9 years, LM 11.3 +/- 8.2 years and LJ 11.6 +/- 9.1 years. Taking in account age group by decade, from 25 to 40 years the most accurate method is the SB method and from 40 to 60 years the most accurate method is the LM method. Between 61 and 70 years of age, all methods are quite equivalent. After the age of 70, all methods are inaccurate although the IC method is the most outstanding. Concerning bias, results show a global underestimation for all methods, although less using the LM method. By decade, as in several studies, this study highlights the tendency to overestimate the age of young individuals, and vice versa. The Spearman correlation coefficients were respectively 0.67 for the IC method, 0.66 for the SB method, 0.59 for the LM method and 0.57 for the LJ method. The ICC was respectively 0.62 for the IC method, 0.55 for the SB method, 0.43 for the LM method and 0.45 for the LJ method.

Discussion and conclusions: Overall, the accuracies of these four anthropological methods for age estimation are close, but when age groups are taken into account, each method may not be applied during all of the lifespan with the same weight. The difficulty is to find the good combination of methods. Two approaches could be distinguished – the multifactorial aging method described by Lovejoy and the Two Step Procedure proposed by Baccino. For aging techniques, the correlation coefficient is not the best informative parameter. Inaccuracy and bias are more useful. Experience and training may change results obtained by the various methods, and more particularly for the LJ method which is less useful in forensic practice.

Age Estimation, Forensic Anthropology, Comparison of Methods