A82 The Issue of Age Estimation in a Modern Skeletal Population: Are Current Aging Methods Satisfactory for the Elderly?

Annalisa Cappella, BS, Via Mangiagalli 37, Milano 20133, ITALY; Marco Cummaudo, MA, LABANOF, V. Mangiagalli, 37, Milan 20133, ITALY; Elena Arrigoni, LABANOF, V. Mangiagalli, 37, Milan, ITALY; Daniele M. Gibelli, PhD, LABANOF, Sezione di Medicina Legale, Dipartimento di Scienze Biomediche, per la Salute, V. Mangiagalli, 37, Milan 20133, ITALY; Davide Porta, BS, V. Mangiagalli, 37, Milan 20133, ITALY; and Cristina Cattaneo, PhD, Universta Degli Studi Di Milano, Milan 20133, ITALY*

After attending this presentation, attendees will gain insight into the reliability of the current skeletal age-estimation methods tested on a modern cemetery population of known sex and age. The presentation will focus primarily on the issue of age estimation of elderly individuals for whom the identification of the correct age range seems more problematic. At the same time, an overview of the applicability of each method, based on the survival of the skeletal sites of application of the method, will be provided.

This presentation will impact the forensic science community by pointing out the advantages and the limitations of current methods of age estimation when approaching skeletal remains of elderly individuals.

The skeletal age estimation of individuals is one of the main tasks in forensic anthropology. From 1920 to the present, several methods have been developed, each with its limits, mean error, and age ranges in which that particular method proved to be more reliable. The main idea behind age assessment in adults is related to the analysis of the physiological degeneration of particular skeletal structures with age. The main issues with these procedures are due to the fact that they have not been tested on different populations and in different taphonomic contexts and that they tend to underestimate the age of older individuals. The methods currently used by anthropologists have in fact been standardized on archaeological and historical collections that may not completely reflect the characteristics of a modern population, especially from a demographic point of view. In addition, the increased life expectancy at birth has pointed out the need for further research on the estimation of age ranges in skeletal remains belonging to elderly individuals.

In the present study, the following methods were taken into account: Suchey-Brooks (symphysis pubis), Lovejoy (auricular surface of the ileum), Iscan (fourth rib's cartilaginous end), Meindl-Lovejoy (ectocranial sutures), Rougé-Maillart (acetabulum combined with auricular surface), and Beauthier (palatine sutures).

The purpose of this study was to test the applicability and the reliability of these methods on a contemporary population of skeletal remains of 165 elderly individuals of known sex and age (ranging between 50 and 98 years), exhumed 20 years after their burial. Although the skeletal remains were generally in good condition, some skeletal sites showed a lower survival due to taphonomic influences and consequently it was not always possible to test all the methods on the entire population. The results show that the methods with the highest percentage of applicability were Lovejoy (89%) and Rougé-Maillart (79%), followed by Suchey-Brooks (56%) and Meindl-Lovejoy (37%). Those with the lowest were Beauthier (36%) and Iscan (24%).

In regard to the age estimation accuracy, Rougé-Maillart (88%) and Lovejoy (82%) showed the best results in terms of the correct identification of the age ranges in which the chronological age of the individuals was included. These percentages are reduced to 70% with Suchey-Brooks (2σ), 64% with Beauthier, 46% with Meindl-Lovejoy, 45% with Iscan, and 20% with Suchey-Brooks (1σ).

Despite this, the only method that proved to be reliable when dealing with over-60-year-old individuals was Rougé-Maillart. The main limit of this method was due to the fact that the age ranges are too small (nine years). Therefore, at this time, the probability of associating an individual to the wrong age class is too high. The first step to improve the method could be the redefinition of the age classes in wider ranges without neglecting the need for further testing on a wider sample.

This research has shown how, for older adults, the study of both acetabulum and auricular surfaces may be more reliable for aging. This is also in accordance with the fact that auricular surface and the acetabulum are the areas that more frequently surviving taphonomic insult.

Forensic Anthropology, Age Estimation, Old Adults