



Physical Anthropology Section – 2005

H70 The Application of the Lamendin and Prince Dental Aging Methods to a Bosnian Population: Formulas for Each Tooth Group Challenging One Formula for All Teeth

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The goal of this presentation is to evaluate the application of the Lamendin dental aging method and Prince's modification of the Lamendin method to a Bosnian population. This research project tests the accuracy of formulas developed for dental age estimation for each tooth group in comparison with one formula for all teeth, made by Lamendin and Prince's modification of the Lamendin method as applied to a Bosnian population. The sample consists of 847 teeth (incisors and canines) from 200 males of known age.

This presentation will impact the forensic community and/or humanity by demonstrating a successful application of this technique, which can be used as a tool for age determination of skeletal remains.

The unique DNA led identification process created by ICMP in Bosnia and Herzegovina on such a large number of missing persons also requires accurate aging techniques for antemortem-postmortem comparison.

One of the more recently developed techniques, which has proved to be simple and accurate (Soomer *et al.* 2003), is the Lamendin method for age determination of adults from single-rooted teeth (Lamendin *et al.* 1992), as derived from a French population. The primary components of this method are measurements of periodontosis and root transparency. Lamendin presented the following simple equation for age assessment: $A = 0.18 \times P + 0.42 \times T + 25.53$ (where: A = age in years, P = periodontosis height / root height x 100 and T = transparency height / root height x 100).

Prince and Ubelaker (2002) modified Lamendin's method by adding root height (RH) to the equations for white and black males and females. The equation for white males is: $A = 0.15 \times (RH) + 0.29 \times P + 0.39 \times T + 23.17$. Prince claimed that inclusion of root height reduced the mean difference and therefore improved accuracy.

Skeletal remains found in mass graves in Bosnia and Herzegovina present additional problems that can be addressed with improved age determination techniques. The remains are often commingled or incomplete, with skulls often separated from the rest of the skeleton. Therefore simple, quick and accurate dental aging methods may facilitate the re-association of crania and mandibles to postcranial elements. With passing time, exhumed remains are more deteriorated and sometimes only teeth are available for age estimation.

The Lamendin method and Prince's modification of the Lamendin method have already been proven useful when applied to a Bosnian population (Sarajlic *et al.* 2003) but both authors, Lamendin and Prince, developed only one formula for all single rooted teeth. According to their methodology, the authors developed six formulae for dental age estimation, three for maxillary and three for mandibular teeth: central incisors, second incisors and canines. The estimated ages obtained by those formulas have been compared with the estimated ages obtained with the original Lamendin and Prince formulae as well as with the estimated age from the formula developed on the whole sample.

The estimation of age according to the formulae developed for each tooth group was significantly more accurate than the estimation of age from Lamendin's and Prince's formulae and than the estimated age from the formula developed on the whole sample.

The best results were obtained with the second maxillary incisors giving mean error of 6.60 years with standard deviation of 5.08 and standard error of 0.50. The lowest mean error, 4.82 years, was produced by the age group of 40 – 49 years.

However, regardless of which formulas are used, there is a consistent overestimation of age in younger individuals and underestimation of age in older individuals.

Dental, Age Estimation, Bosnian