F5 Age Estimation by Pulp/Tooth Ratio in Canines

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After attending this presentation, attendees will see results of the research and an explanation of how the new method for age estimation works.

This presentation will impact the forensic community by showing a method for age estimation in adults.

Age estimation in adults is an important challenge both in anthropological and forensic fields and apposition of secondary dentin is often used as an age indicator. In recent papers, *Cameriere et al.* studied the use of the pulp/tooth area ratio on canines as age indicators. The present investigation was conducted to examine the possible application of the pulp/tooth area ratio by peri-apical images as an indicator of age- at-death on a Portuguese sample. The statistical model was subsequently compared with that obtained from a study conducted on an Italian sample to establish whether a common regression model for both Italian and Portuguese samples could be developed. The Portuguese sample consists of 126 canines of males and 132 canines of females aged between 20 and 84 years. They belong to the osteological collection of Museum of Anthropology at Coimbra University. The Italian sample consists of 114 canines of males and 86 canines of females aged between 20 and 79 years and was previously analyzed in [20]. It belongs to the Frassetto osteological collection of Sassari (Sardinia) and are housed in the Museum of Anthropology, Department of Experimental and Evolutionistic Biology, University of Bologna. Statistical analysis was performed in order to obtain multiple regression formulae for dental age calculation, with chronological age as a dependent variable. Gender and the pulp/tooth area ratio on upper (RA_u) and lower canines (RA_l) were used as independent variables. ANCOVA analysis showed that gender did not contribute significantly compared to the variables RA_u and RA_l. The regression model for the Portuguese sample yielded the following equations: Age=101.3 – 556.68 RA_u when upper canines are considered and Age=92.37 – 492.05 RA_l when lower canines are considered. Both models exhibited about 97% of total variance. The mean prediction errors were ME= 2.37 years and 2.55 years respectively. Comparisons between the previous equation referring to Portuguese sample and the equivalent linear equations proposed by *Cameriere et al.* for Italian sample did not reveal any significant differences between the linear models. These results suggested a common regression model for both Italian and Portuguese samples. The common regression models, describing age as a linear function of RA_u and RA_l, yielded the following linear regression formulas: Age = 100.598 – 544.433 RA_u; Age = 91.362 – 480.901 RA_l. These models reflected 86% and 93% of total variance respectively. The mean prediction errors were ME= 2.68 years and 2.73 years respectively.

Age Estimation, Forensic Odontology, Canine Pulp