F20 Tooth Color as a Possible Indicator for Age

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The goal of this presentation is to investigate the color of tooth roots and crowns in a standardised manner using a spectrophotometer and analyse its relation with chronological age.

Although further research is needed on a more extensive population, this presentation will impact the forensic community and/or humanity by contributing to a better approximation of chronological age of an individual by employing a complimentary technique that should not be very difficult to use, but may have its power in the fact that it supports other more traditional techniques by its outcome.

Outcome: Regression analysis rendered a relation displaying an adjusted R-square between 0.45 and 0.48.

Introduction: Color is a subjective sensation and is as such difficult to use in a quantitative study. On the other hand, a number of clinical studies on extracted teeth have shown a good correlation between tooth color and age.

Aim: The purpose of this study was to examine the usefulness of a specific spectrophotometer in determining tooth color on extracted and non-extracted teeth and to look for any age relationship.

Materials and methods: There were two parts in this study. In part 1, the tooth collection of Ten Cate *et al*., 1977 was used and single rooted teeth were selected out of each of the 5-year age groups (ages ranged from 15 to 84, both for males and females). Color measurements were performed on the mesial and vestibular sites of the roots as well as on the mid-vestibular aspects of the enamel crown. In part 2 the color of certain upper anterior teeth was measured in living patients. Heavily restored, endodontically treated or heavily discolored teeth were not taken into account. In total, 217 upper anterior teeth from 78 patients ranging between 15 and 83 years of age were measured with a spectrophotometer, a technologically advanced shade taking system. It digitally analyses the shades and immediately transmits the data to the main unit via an infrared interface. It records hue, value and chroma according to the CIE-LAB system without being affected by lighting conditions. Each color measurement was repeated five times.

Results: Statistical analysis of the results revealed regression for- mulas for both extracted and non-extracted cases, displaying an adjusted R- square of 0.48 and 0.45 respectively.

Discussion: The high correlations found in an earlier reported study by Lackovic and Wood, 2000 on the same material of Ten Cate *et al*., 1977 could not be confirmed, although similar age-related trends were found. The disadvantage of the spectrophotometer employed is that only the central part of the clinical crown was taken into account for the determi- nation of tooth color. On the other hand it is clear that this technique opens possibilities for future research on age estimation in living individuals.

Forensic Odontology, Chronological Age, Dental Age Estimation

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