G29 The Accuracy of Two Dental Age Estimation Methods on Saudi Children: Cameriere's Measurement of Open Apices and The London Atlas of Tooth Development

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The goal of this presentation is to demonstrate how well two methods of Dental Age Estimation (DAE) perform when used on the Saudi population and how they compare with each other. The two methods are: (1) analysis using The London Atlas of Tooth Development and Eruption; and, (2) Cameriere's Measurements of Open Apices of Mandibular Teeth.

This presentation will impact the forensic science community by providing inter-population evidence to demonstrate the accuracy of two new methods of dental age estimation and highlight the differences in conducting these two methods on Saudi children. This presentation will also enhance understanding of the importance of the assessment of dental development in various dental age estimation methods.

Dental development is frequently used to assess maturity and estimate age. The goal of this study was to test and compare the accuracy of two methods of dental age estimation, Cameriere's formula (measurements of mandibular teeth's open apices) and analysis using The London Atlas of Tooth Development, in Saudi children.

Materials and Methods: The sample consisted of 400 Saudi males and females between the ages of 6 and 15 years. Inclusion criteria were good quality, clear panoramic dental radiographs (Orthopantomographs (OPGs)) of healthy patients with no medical history of systemic diseases/disorders. Exclusion criteria were unclear radiographs, hypodontia (one or more missing teeth), hyperdontia (one or more extra teeth), gross pathology (torodontism, microdontia, amelogenisis imperfecta, dentinogensis imperfecta, tumors, abscesses, fractures, etc.), presence of gross caries, or previous orthodontic treatment. Age estimation was performed using Cameriere's formula (measurements of mandibular teeth's open apices) and The London Atlas of Tooth Development on the left side of the jaw.

Chronological age (real age) was blinded from the researchers until all subjects radiographed were assessed and age estimation was completed. Data were managed and analyzed using the SPSS program (v24). Inter- and intra-examiner reliability tests were calculated on a random 10% sample from the radiographs to determine the kappa statistic.

Results: The intra-examiner reliability test was 0.89 and the inter-examiner reliability test was 0.8, which demonstrates excellent agreement.

Mean difference between Estimated Age (EA) and Real Age (RA) was -0.45 years for The London Atlas with a standard deviation of 1.61 years, and was -0.83 years for Cameriere's formula with a standard deviation of 1.34 years; both methods consistently underestimated actual age. The absolute mean difference was 1.19 years and 1.16 years for The London Atlas and Cameriere's formula, respectively. The mean difference between EA and RA using The London Atlas was -0.61 years for males and 0.23 years for females, with no statistical significant difference between genders. Cameriere's formula gave a mean difference between EA and RA for males of -0.89 years and -0.77 years for females, with no statistically significant difference between genders.

Conclusion: The London Atlas of Tooth Development was easier to use because all teeth in both jaws can be used and the availability of an extra dental development stage resulted in better measures of accuracy on Saudi populations.

Age Estimation, Dental Development, Saudi Arabia