



G11 The Accuracy of the London Atlas of Human Tooth Development and Eruption in Dental Age Estimations of Saudi, Spanish, and Italian Children

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After attending this presentation, attendees will better understand similarities between various populations and that new evidence-based methods of age estimation can be used internationally without a need for a population-specific method.

This presentation will impact the forensic science community by increasing understanding as to why certain age estimation methods are applicable to variable populations with good measures of accuracy and why others are population-specific.

Schemata of dental development are used frequently to assess maturity and estimate dental age, yet there is still little evidence of their accuracy when used for various ethnic populations. The goal of this study was to test and compare the accuracy of The London Atlas of Tooth Development and Eruption when used for dental age estimation in Saudi, Spanish, and Italian populations.¹

Materials and Methods: The sample consisted of 400 Saudi, 400 Spanish, and 300 Italian males and females between the ages 6-15 years. Inclusion criterion was: good quality, clear panoramic dental radiographs (Orthopantomograms (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 (taurodontism, microdontia, amelogenesis imperfecta, dentinogenesis imperfecta, tumors, abscesses, fractures, etc.); presence of gross caries; or previous orthodontic treatment. Age estimation was performed using The London Atlas of Tooth Development and Eruption on the left side of both upper and lower jaws by direct comparison with the diagrams.

Chronological age ("Real Age" (RA)) was blinded from the researchers until all radiographs were assessed and age estimation was completed. All data were managed and analyzed using the Statistical Package for the Social Sciences (SPSS) program (v24). Inter- and intra-examiner reliability tests were performed on a random 10% sample from the radiographs and the appropriate kappa statistic was calculated.

Results: Intra-examiner reliability test kappa was (0.9) and the inter-examiner reliability test kappa was (0.87), which indicates excellent agreement.

Mean difference between Estimated Age (EA) and RA in all populations combined was 0.21 years with Standard Deviation (SD) of 0.978 years, and absolute mean difference of 0.645 years.

The Saudi population revealed the mean difference between EA and RA to be 0.247 years (SD 0.769 years) with no bias (p 0.08), and the absolute mean difference was 0.620 years. The Spanish population exhibited the lowest mean difference (0.099 years), but with the largest SD (1.09 years) with no bias (p 0.071), and the absolute mean difference was 0.857 years. In the Italian population, the mean difference was 0.451 years with a standard deviation of 0.965 years, with positive no bias (p 0.006), and the absolute mean difference was 0.782. Thus, there were no statistically significant differences between populations.



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Conclusion: The London Atlas of Tooth Development and Eruption is applicable to the Saudi, Spanish, and Italian populations with good measures of accuracy.

Reference(s):

1. AlQahtani S.J., Hector M.P., Liversidge H.M. Brief communication: The London Atlas of Human Tooth Development and Eruption. *American Journal of Physical Anthropology*. 2010 Jul;142(3):481-90. doi: 10.1002/ajpa.21258.

The London Atlas, Age Estimation, Accuracy