

G29 Forensic Age Estimation Based on the London Atlas of Human Tooth Development and Eruption Assessment in a Population With Systemic Disorders: A Pilot Study

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Learning Overview: After attending this presentation, attendees will understand why using the London Atlas of Human Tooth Development and Eruption on panoramic radiographs is of limited value for age estimation in children and subadults with special needs, such as with systemic disorders.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing why using the London Atlas is of limited value for age estimation in a special needs population, for example, those with systemic disorders.

Introduction: The forensic estimation of chronological age has played an increasingly important role, not only in the identification of human remains, but also in living individuals due to the phenomenon of immigration and sexual abuse of undocumented trafficked children.

Goal: The goal of this research was to validate the use of the London Atlas, an atlas already used in the normal population, in estimating chronological age in a population with special needs and/or with systemic disorders.

Materials and Methods: A sample of 163 orthopantomograms from two independent medical institutions were collected from 133 patients, between 4 and 23 years of age, with systemic disorders in the appointment of patients with special needs. The orthopantomograms were divided into two groups, 95 from patients with systemic pathologies that have repercussions on dental development and 68 with systemic pathologies without dental repercussions. Dental ages were estimated by the London Atlas using the left side, then independently using the right side of the maxilla. The intra- and inter-observer agreements were evaluated. The difference between the dental age estimates and the chronological age and its absolute value were computed and analyzed.

Results/Discussion: Statistically significant differences were obtained between estimates and chronological age, revealing a general prevalence for underestimation; except for ages less than 12 years. Nevertheless, the underestimation in individuals less than 16 years of age was not significant (with an average of less than one month), while the underestimation was quite significant for patients at least 16 years of age (with an average over 26 months). Furthermore, for those patients with systemic diseases with dental repercussions, a greater error in underestimation was obtained, which indicates that the midpoint values should be reassessed in patients with Down's syndrome, chromosomal alterations, syndromes, and central nervous system disorders.

Conclusions: Hence, this Atlas can be potentially used as a tool for age estimation, but we suggest further studies with larger samples to create adequate atlases for all the required scenarios, in particular, diagrams for patients with special needs development who are more than 12 years old and, specifically, for those more than 16 years of age.

Forensic Age Estimation, London Atlas, Systemic Disorders