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A NEW APPROACH TO MEASURE PERFORMANCE OF DENTAL AGE ESTIMATION METHODS

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Background: The accuracy of dental age estimation methods is usually measured as the mean difference between dental and chronological age, however this does not reflect performance over an age range. The aim of this study was to measure performance of dental age estimation methods across age categories as well as a single value for a test sample.

Design: This was a retrospective study of archived dental panoramic radiographs of 946 children aged 3-16. Dental age estimation methods tested include dental maturity scores (Demirjian, Willems, Nolla), pictorial charts (Schour and Massler, Ubelaker and the London Atlas) and tooth specific methods using Demirjian and Moorrees tooth stages (using I1 to M2 and only M2). Mandibular left teeth (excluding third molar) were assessed using each method and dental age estimated for all dentally immature individuals. Accuracy of dental age estimation methods was calculated as the mean difference and absolute mean difference between dental and chronological ages. The number of one year categories with at least 50% of children correctly assigned was counted.

Results: The number of age categories with at least 50% correctly assigned children ranged from one (Demirjian) to nine (London Atlas). The oldest age category with at least 50% correctly assigned children was 13 years. The London Atlas performed best in all measures. Several methods, including Willems, had good accuracy but attained only at least 50% correct age category assignment in 4 or 5 age categories.

Conclusion: The London Atlas performed consistently better than all other dental ageing methods, probably because it was specifically designed to estimate age.

KEYWORDS: Forensic Odontology, Dental Age Estimation, London Atlas.