F34 The Importance of Population-Specific Reference Standards in Dental Age Assessments

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After attending this presentation, attendees will be able to appreciate the importance of population reference standards in dental age assessments. This will be presented in the form of a research study that aimed to estimate the age of Chinese subjects using three different population-specific reference standards.

This presentation will impact the forensic science community by demonstrating the need for developing population standards for accurate age assessments. Attendees will further learn how to conduct age assessments through developing population-specific standards, which is a unique method developed by Dental Age Research London Information Group (DARLInG).

Age assessment has become an integral part of forensic medicine due to poor birth registration practices and the high number of asylum claims in major countries. Ethnic variation in physical maturity is an established phenomenon; hence accuracy of the estimated age frequently varies based on the reference data from which the original scores were obtained. To analyze the effect of ethnic specific standards, this study was designed to test the accuracy of age estimated from three different population standards. A total of 266 subjects constituting an equal number of males and females aged 2 to 21 years old, and of southern Chinese ethnicity were randomly chosen from patients of Prince Philip Dental Hospital, Hong Kong. Panoramic radiographs taken previously for clinical diagnostic purposes were scored according to Demirjian's classification of dental development stages. The Dental Age (DA) was estimated by obtaining mean ages of dental development from three datasets: French-Canadian, United Kingdom (UK) Caucasian, and Hong Kong (HK) Chinese. Following this, the difference between Dental Age and Chronological Age (CA) was calculated for each method (CA-DA). The overall mean age difference using the French-Canadian dataset was -0.62 years for males and -0.36 years for females, and 0.25 years for males and 0.23 years for females using the UK Caucasian reference data. The HK Chinese data estimated age as close as -0.02 years for both males and females. Statistical significance was set at $p<0.01$ and the Pearson correlation analysis was conducted between the DA-CA values obtained from three datasets. Poor correlation was observed using the UK Caucasian ($r=0.70$) and the French-Canadian ($r=-0.05$) datasets; however, in contrast, high correlation was observed in the HK Chinese ($r=-0.28$) dataset that was statistically significant ($p<0.01$). It is concluded that the HK Chinese reference data accurately estimated the age of the HK samples; thus, emphasizing the need for population-specific data to ensure accurate age assessments.

Reference Data, Dental Age, Dental Maturity

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