G18   The Applicability of Caucasian and Chinese Dental Reference Datasets for Age Estimation in Hispanic Children in Texas

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Learning Overview: After attending this presentation, attendees will better understand the importance of accuracy of the estimated age using two ethnically different dental reference datasets in Hispanic children. This will be presented in the form of a research study aimed at assessing the age of children of Hispanic origin in south Texas using the United Kingdom Caucasian and Hong Kong Chinese dental reference datasets.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the importance of ethnic variations in dental age estimation. Attendees will learn how ethnic variations could influence the accuracy of estimated age by conducting dental age estimation using two ethnically different reference datasets in children belonging to Hispanic ethnicity in south Texas.

Dental development has been used as a forensic dentistry tool to estimate the age of subjects involved in falsified age claims and those without authentic birth documentation. The United States Border Agency reported a recent increase in the number of Unaccompanied Alien Children (UAC) intercepted in the United States' southwest border. The majority of children belong to Hispanic ethnicity originating from Central and South American countries. To date, no dental age estimation method has been evaluated for applicability in a broader age range of children of Hispanic origin.

This study aimed to assess the applicability of United Kingdom Caucasian and southern Chinese dental reference datasets for age estimation in Hispanic children in Texas. Dental panoramic radiographs of 120 healthy children constituting 60 females and 60 males aged 6 to 17 years were obtained from the University of Texas Health San Antonio School of Dentistry archives. All the teeth in left side maxillary and mandibular arches were scored according to Demirjian's classification of tooth development stages (A to H). Chronological Age (CA) was calculated from birth date and the date of exposure of radiograph. To calculate the Dental Age (DA), the mean age (x) corresponding to each tooth's development stage was obtained and averaged from the Caucasian and Chinese dental reference datasets, separately for females and males. Statistical significance was set at $p<0.05$, and paired sample *t*-test was used to compare the difference (CA-DA) between CA and DA obtained from the Caucasian and Chinese reference datasets. The Caucasian reference dataset overestimated the age of Hispanic females and males by 0.60 years and 0.42 years, respectively. Similarly, the Chinese reference dataset overestimated Hispanic females' and males' age by 0.84 years and 0.49 years, respectively. The difference was not statistically significant, except for Hispanic males using the southern Chinese dataset ($p<0.05$). In females, the estimated age (CA-DA) difference ranged from -1.82 to +0.68 years using the Caucasian dataset and -3.02 to +0.36 years using the Chinese dataset. In males, the difference ranged from -1.66 to +1.40 years for the Caucasian dataset and -2.71 to +1.74 years for the southern Chinese dataset. It is concluded that, on average, both Caucasian and Chinese dental reference datasets overestimated the age of Hispanic males and females by over six months. These inaccuracies indicate the very strong need for a Hispanic-specific dental reference dataset.

Age Estimation, Hispanic, Children

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