

ABSTRACT

Validation of reference data on wisdom tooth mineralization and eruption for forensic age estimation in living persons

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Estimation of dental age is an important part of forensic age estimation in living persons. As the quality of the values given in population-specific reference studies has a great impact on the estimation, the aim of this study was to validate reference data for wisdom teeth mineralization and eruption of a German population concerning the diagnosis of the age limit of 18 years in persons with known age. Mineralization and eruption was evaluated in 307 orthopantomograms of Central European subjects aged 17.5-18.5 years. Dental age was estimated using reference data and compared to chronological age. Statistical methods were used to analyze the differences and to propose adjusted reference values. Estimation of dental age relying on mineralization resulted in overestimations of 2 years on average in 76% of the males and 82% of the females. Using eruption, all men and 75% of the women were overestimated by up to 7 years. The differences between estimated and chronological age in both men and women were associated with the mineralization and eruption stage, respectively. The higher the stage, the higher was the risk of overestimation. The mineralization stages up to stage E were associated with underestimations. Using the proposed adjusted reference values resulted in more accurate estimations of dental age. Validation of reference values for dental age estimation showed great overestimations resulting in high error rates with numerous persons being younger than the estimated dental age. Adjustments are proposed which reduce differences between estimated dental age and chronological age.