Accuracy of Cameriere et al Regression Equation In south Indian Population

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Abstract

Age estimation in children is not only important in clinically dentistry but also in forensic dentistry. The orthopantomograph samples of 100 healthy children aged between 5-15 years were selected and applied to Cameriere et al regression equation. We observed underestimation of age in boys and overestimation in girls as compared to their chronological age.

Keywords

Forensic dentistry, Cameriere et al regression equation, South Indian population.

Introduction

Tooth formation is widely used to assess maturity and predict age. In clinical dentistry, this information aids in diagnosis and treatment planning.[1] The continuous patterns of tooth development can be observed on a longitudinal series of radiographs and various mineralization stages. [2-6] Previously number of methods have been proposed to determine dental age,[7-15] but, the system developed by Demirijian has gained wide acceptance.[9] During developmental stages particularly in root formation, a notable difference between sexes arises with females, being advanced when compared with males.[9-19] Earlier Cameriere et al proposed a regression equation for age determination from Open and closed apices in children [16-17]. .Recently it has been reported that Cameriere et al method is more accurate than other methods [19]. It has been reported that tooth development depends on number of factors such as genetic factor, environmental factors, nutritional factors and geographical factors [4-7] . Hence the present study was planned to determine the accuracy of Cameriere et al equation on South Indian Population for age estimation from open and closed apices.

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Material and Methods

The orthopantomographs sample of 100 healthy children aged between 5-15 years were selected. Panoramic radiographs that were unclear or that showed hypodentia, gross pathology and previous orthodontic treatment were excluded. The chronological age for each subject was calculated by subtracting the data of the radiograph from the date of birth. This was a retrospective cross-sectional study. Good quality digital panoramic radiographs were taken for this study during the course of diagnosis and treatment. Orthopantomographs were digitized using a scanner (HP), and images were recorded on computer files by computer aided drafting program (Adobe Photoshop 7). The seven left and right permanent mandibular teeth were recorded. The number of teeth with complete root development and apical ends of the roots completely closed (N0) and open apices (S), was calculated and applied regression equation as following.12 G variable is 1 for boys and 0 for girls.

$$\text{Age} = .387 + 0.282g - 1.692 \times 5 + 0.835N_0 - 0.116s - 0.139s \times N_0,$$

Results and discussion

The requirement for age estimation of living individuals is becoming increasingly important in forensic odontology. Since, there are increasing numbers of illegal immigrants without any

documents of birth-date. So, it becomes necessary to develop a simple method to estimate age with an accurate method. In this article, we observed that underestimation of age in boys and overestimation in girls as compared to their chronological age. While, there was no significant difference analysed. This may be due to overestimation in girls same as underestimation for boys . From this finding, we concluded that we have to add some correction factors for applying this equation. It may be due to difference in geographical , genetic and environment factors. So, this equation varies from population to population, hence it requires more study on different population. Chronological age, as recorded by registration of birth date is referred throughout an individual's life. This information is relevant in medical and dental practice for evaluating developmental progress, for educational purposes and in legal maters, particularly in application of criminal law.[9,10] As the results did show statistically significant differences between European countries, one regression equation could not be applied to Indian populations . So, new equation will be required for Indian population on this concept or adding some correction factors in the same for Indian populations.

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