Accuracy of BR Regression Equation In Haryana 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 25 healthy children (13 boys: 12 girls) aged between 5-15 years was selected and applied BR regression equation. I observed that underestimation of age in boys and overestimation in girls as compared to their chronological age.

Keywords

Forensic dentistry, BR regression equation.

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] A number of methods have been proposed to determine dental age,[7-9] 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.[10-11] Previously we proposed a regression equation for age determination from Open and closed apices in children [12] . It has been reported that teeth development is depend upon 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 BR equation on Haryana Population for age estimation from open and closed apices.

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Material and Methods

The orthopantomographs sample of 35 healthy children (13 boys: 12 girls) aged between 5-15 years was 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 taken for this study during the course of diagnosis and treatment.Orthopantomographs were digitized using a scanner (HP), and images were recorded 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 root development complete 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.

$$Age = 7.083 + 0.493G + 0.931x3 - 0.854S + 0.693N0 - 0.185S\ N0 \quad \text{Equation (1)}$$

Results and conclusions

We observed that underestimation of age in boys and overestimation in girls as compared to their chronological age (Table 1) .It may be due to different in geographical ,genetic and environment factors. So this equation various from population to population, hence it should be required more study on different population.Chronological age, as recorded by registration of birth date, is referred to 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] Various studies have reported that morphological measurements can be reliably made in orthopentomographs provided that

some corrections are made to take into account the individual variability of tooth size and the differences in magnification of radiographs and angulations between x-ray beam and film.[12] The present regression equation I is derived for age estimation from children. This equation may be used as a diagnostic tool for age estimation in children, where in medico legal cases and clinical dentistry.

Table I: Different chronological and estimated age

Sr.No	Chronological age	Estimated age
1 (M)	4.5	3.8
2 (M)	6.8	5.7
3 (M)	8.7	7.6
4 (M)	8.9	8.2
5 (M)	11.2	10.9
6 (M)	6.7	5.6
7 (M)	7.8	6.7
8 (M)	12.7	11.6
9 (M)	15.3	13.2
10 (M)	13.2	12.7
11 (M)	10.6	9.8
12 (M)	7.8	6.9
13 (F)	8.3	8.6
14 (F)	11.9	12.3
15(F)	10.4	10.7
16 (F)	14.5	14.8
17 (F)	8.8	9.6
18 (F)	7.9	8.1
19 (F)	11.9	13.8
20 (F)	11.2	12.2
21 (F)	6.5	8.8
22 (F)	9.7	10.2
23 (F)	11.9	12.9
24 (F)	7.3	8.8
25 (F)	11.2	13.9

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Fig. 1: Parameter of Study