Estimation of dental age: comparative study of different methods using teenage population of Sri Lanka from 11 to 16 years

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POSTER PRESENTATION

J Forensic Odontostomatol
2017 Nov 1; Supp1(35): 94
ISSN :2219-6749

ABSTRACT

Knowing the physiological age of an individual is essential in a civilized society for many purposes. The best documentary evidence for age of citizens is the birth certificate issued by the relevant authority in any country. For living persons age becomes important in legal and administrative purposes, many of which are dependent on an individual attaining a certain age (e.g. a minimum age to obtain a driver's license, employment etc.). A scientific method of age estimation is required for an individual whose birth certificate is not accessible or not available due to various reasons.

Estimation of age is similarly important for an unknown deceased person, where many of the legalities associated with death (such as issuing of a death certificate, payment of insurances, crime investigations) are dependent on positive identification, including an assessment of the age of the deceased.

The estimation of age is one of the tasks performed in Medico-legal units where Forensic Odontologists have to assist in investigations regarding age of both living and the dead. When Odontology experts are requested to estimate age on the above circumstances, the methods comprising of Western and European data are being used assuming that tooth development and maturity of Sri Lankan population follow the same pattern and rate as in the West and Europe. But those data referred above may not be directly applicable to Sri Lankan population since the biological changes could vary according to ethnicity, geography, genetic pattern so on. Hence the author in conjunction with other professionals in different fields designed the present study to investigate how appropriate and accurate existing data sources are to the Sri Lankan population.

The study conducted for two years from April 2014 reviews the principles and methodology in the most commonly used six methods using dental radiographs in Sri Lanka. This has been conducted in the institute of Oral Health in Sri Lanka using panoramic radiographs of teenage population from 11 to 16 years both males and females. The sample size (35 for each age group and the total being 420) calculation was done according to the single sample mean formula and inclusion and exclusion criteria were well adopted.

The statistical analysis shows the mean and SD for each age group separately for males and females and reveals the best fit method of dental age estimation out six for the population concerned. Most importantly a simple method to estimate age using IOPA radiographs of left mandibular molars was established based on the best fit method to minimize the use of panoramic radiographs which are expensive and less accessible to clinicians and Forensic practitioners in Sri Lanka.