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LAPORAN AKHIR

THE ACCURACY OF GUSTAFSON AND JOHNSON AGE ESTIMATION METHODS FOR MALAY ADULTS IN KELANTAN

PENYELIDIK

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INTRODUCTION

Age estimation is useful for human identification[1] and in determining legal age for criminal responsibility.[2] Both applications are related to local legal requirements and can be applied to ageing both human remains and living people.[3]

Dental evidence is of great importance for forensic age estimation procedures as teeth are the most durable structure of the human body[4] and they give results of acceptable accuracy for assigning the age.[5] Moreover, dental post-mortem data can predict the age of a person from approximately 18-20 weeks 'in utero' until the last tooth is lost.[6]

Dental age can be evaluated in young children with higher accuracy because many teeth are undergoing development and mineralization simultaneously.[7] However, most of teeth have completed their development by approximately 14 years old,[8] leaving only the third molars to continue maturing until a later age.

The third molars are variable teeth in terms of position, size, shape, timing of formation and eruption and agenesis,[9] nevertheless, many studies found that the third molar development was applicable for age estimation.[2, 10-14]

There is no specific trend of sexual differences in the third molar development was reported across several populations and geographical areas. Studies on American Whites,[10] Texas Hispanic,[15] Europeans such as Belgian,[16] Spanish,[11] Turkish[17] and Austrian[18] and several Eastern Asians[2, 14, 19] reported that the third molar development is more advanced in males than in females. Few reverse findings are reported among North Indian[12] and American Black.[10]

Since there is no information regarding to age estimation in Northeast Malaysian population, the present study aimed to assess the variability of the lower third molar (tooth 38 and 48) development in Northeast Malaysian population aged between 14 to 25 years in both sexes, with respect to the side of dentition, and to generate an age prediction model. The accuracy and the regression analyses were also compared with other publications.

MATERIALS AND METHODS

Materials

Orthopantomograms (OPG) from the Hospital Universiti Sains Malaysia's archive were screened. Poor quality OPGs and those subjects with obvious dental pathology, known history of chronic medical illness and hormonal deficiency were all excluded. Non locals, based on the information from their new registration identification card number in the dental records, were also excluded.

All OPGs had been taken using Orthoralix 9200 (Finland) with different xray doses depended on the patient's body size, 70kV (small), 74kV (medium) and 78kV (large). The distance between subject and X-ray source was set at 0-14mm (default=7mm) and the exposure was 12 seconds. The study was granted ethical clearance to access dental records by the Universiti Sains Malaysia Human Ethics Committee. The handling of dental records complied with the highest standard of ethics.

Based on sample size calculation, a total of 1080 orthopantomograms of Northeast Malaysian population aged between 14 and 25 years (540 males and 540 females) were required. The calculation of the sample size was based on these parameters: the mean difference of 1.5 years with 80% power and alpha 0.05 which consists of 45 subjects in each study group (45 x 12 age