Mesiodistal crown dimension of permanent teeth and mixed dentition analysis for Southern Chinese in Hong Kong

Abstract:
The purpose of this study is to establish normative data on the mesiodistal crown dimension of the permanent teeth of Chinese in Hong Kong. The sample comprised 400 sets (200 boys and 200 girls) of plaster casts of Southern Chinese children with mean age of 12.6 years old. The mesiodistal crown diameters of the permanent teeth were measured with the method described by Moorrees et al. (1957). The averaged error for one permanent tooth was about 0.02 mm. The method error for measuring a group of 6 permanent teeth form central incisor to first permanent molar was about 0.1 mm. The mean widths of the teeth of males and females were reported. The present data did not totally support the ideal of ‘field theory’ for the tooth size variability of individual tooth. Bilateral asymmetry show larger difference in male. The mean bilateral asymmetry ranged from 0.013 to 0.039 mm and considered not clinically significant. The teeth of male in general were larger than those of female except the lower central incisor. Sexual dimorphism ranged form 0.74% (0.04 mm) to 6.16% (0.41 mm), and all showed statistically significant differences (P<0.005) except the lower central incisor. Upper and lower canines were the most sexual dimorphic teeth and revealed a “canine field” of sexual dimorphism. The mean mesiodistal crown diameters were also compared statistically with previous reported data of other populations. The permanent teeth of Hong Kong Chinese were relatively larger in mesiodistal crown dimension compared with American Whites, Japanese, Filipinos, but were smaller than those of Australian aboriginals and American Negroes. The tooth sizes of the Southern Chinese was generally comparable to those of the Beijing Chinese and Taiwan Chinese. Mixed dentition analysis was studied.
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The correlation coefficients between the independent variable (L1221) and the dependent variables were 0.64 (U345) and 0.70 (L345) for male and 0.67 and 0.70 for female. The regression equations derived from multiple regression models with the inclusion of sex revealed a higher coefficient of determination ($R^2$), ranged from 47 to 57%. The values of standard error of estimate (SEE) was around 0.75, the coefficient B ranged from 0.54 and 0.60, and coefficient A ranged from 10.65 and 8.66 for the upper and lower arch respectively. It was found that the prediction models were more accurate for the prediction of lower canine-premolar size than that for the upper one. The prediction equations developed with inclusion of sex and probability tables were generated for clinical use in Hong Kong Chinese children.