TOOTH SIZE DISCREPANCIES IN A GROUP OF SRI LANKAN ORTODONTIC PATIENTS AMONG DIFFERENT MALOCCLUSION GROUPS

Nandani Nagarathne[1]*, Kumari Rathnethilake[2] and Chantha Jayawardena[3]

[1]Division of Orthodontics, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka
[2]Base Hospital Chillaw, Sri Lanka
[3]Department of Basic Sciences, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka
*spnpnagarathne@gmail.com

A tooth size discrepancy (TSD) is a disproportion of the sizes of the teeth between maxillary and mandibular arches. Significant TSD prevents an ideal occlusion being produced at the end of orthodontic treatment. Therefore, the absence of a TSD is included as seventh ''key'' for achieving an ideal occlusion. Overall Bolton ratio (OR) and anterior Bolton ratio (AR) have been introduced to estimate TSDs. Gender, ethnicity and class of malocclusion have been proved to have influence on TSDs.

The aims of this study were to determine the distribution of tooth size discrepancies calculated using Bolton ratios in a sample of Sri Lankan orthodontic patients and to determine the variation among different classes of malocclusion. The study sample consisted of 110 pre-treatment dental casts with fully erupted and complete permanent dentitions from first molar to first molar, which were selected randomly from the records of patients who attended the Orthodontic Clinic of the Faculty of Dental Sciences, Sri Lanka. Models with tooth deformities and restorations were excluded. Mesio-distal measurements were taken using a digital micrometer and anterior and overall Bolton ratios were calculated according to the standard formula. One sample t-test revealed that there was no significant difference in the first and the second set of readings.

There were 48 males and 62 females and the mean age was 12.52 ± 2.45 years. The mean anterior Bolton ratios (AR) were 77.9 ± 2.93, 78.61 ± 3.3, and 78.63 ± 3.9 for the Class I (n=45), Class II (n=45) and Class III (n=20), respectively. The mean overall ratios (OR) were 91.52 ± 2.71, 91.54 ± 2.67 and 91.85 ± 2.45 for the Class I, Class II and Class III, respectively. A significant sexual dimorphism was not noticed in any of the malocclusion group. One-way ANOVA among 3 different malocclusion groups showed that there was no statistically significant difference in the AR (F=0.63, P= 0.54) and the OR (F=0.12, P= 0.88). When the Bolton ratios (AR and OR) of each occlusion group were compared with those of the original Bolton means (AR=77.2 ± 1.65; OR= 91.3 ± 1.91) a significant difference was found in AR only in the Class II Division 2 (p = 0.04). The number of patients within each group who had discrepancies outside 2SD from the original Bolton means was higher for AR than the OR.

These results indicated that there were no statistically significant differences in the prevalence of anterior TSDs and overall TSDs with regard to malocclusion or gender in our sample. When compared with Bolton means, a clinically significant anterior TSD existed in class II Division 2 group