READER'S FORUM

Bayome M, Park JH, Kook YA

New three-dimensional cephalometric analyses among adults with a skeletal Class I pattern and normal occlusion.

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Q1. This study was a good attempt to present three-dimensional (3D) analysis instead of traditional two-dimensional cephalometric analysis, but the sample size may not have been large enough. How was the sample size calculated for determining the norm values prior to the study?

Q2. Inclusion and exclusion criteria seems somewhat vague. Also, the term 'balanced facial appearance' can be subjective. On Table 5, some data are statistically significant, and some are not. It is not reasonable to come up with an average using this sort of data. The vertical measurement variables seem to be lacking. What is your opinion about this?

Q3. For the basal bone length measurement, the authors used point A and the canine eminence for the maxilla, which seems to be an efficient way to evaluate arch length discrepancy. As for the mandible, the lower border of the mandible was used. For patients who only need orthodontic treatment, not combined surgical treatment, wouldn't it be clinically more efficient to measure the basal alveolar bone of the lower dentition similar to the measurement that was taken in the upper jaw?

Questioned by

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A1. This study features a new 3D cephalometric analysis system that was applied on 3D cone-beam computed tomography (CBCT) images of volunteers with normal occlusion. It evaluated the correlations between several skeletal and dentoalveolar variables. Our sample consisted of 38 volunteers but, as many of the variables were bilateral (right and left sides), the sample size was doubled to 76 since no significant differences were found between the right and left sides. Sample size calculations require a previous knowledge of the standard deviation (SD) of the population which we did not have prior to our study. However, if we use estimated or supposed SD of 2, we would need only 61 cases to be 95% confident of the resulting mean, given the margin of error is 0.5 (mm or degree). Other than sample size, it is important to evaluate the normality of the sample distribution and the robustness of the resultant mean in order to understand how the sample represents the population. In our study, all variables followed the normal distribution. The largest difference between mean and median was at posterior mandibular body length (1.15 mm) and the average for all differences was 0.33 mm. The 10% trimmed means were very close to the total sample means. The average difference was 0.12 mm.

A2. The inclusion and exclusion criteria in our study consisted of 11 items. These items aimed at excluding any abnormality, obvious asymmetry, or previous medical condition or intervention to ensure that the sample represented normal occlusion and normal facial structures. The determination of a balanced facial appearance was the result of the opinion of 2 experienced orthodontists, independently. It refers to

the absence of any apparent facial asymmetry, hyper- or hypo-activity of any facial muscle or any apparent disharmony in the facial features. Table 5 shows the correlation between facial height variables and several sagittal, vertical, transverse, and other dimensional variables. These variables were not expected to show the same trend (all significant or all insignificant) toward correlation with the facial height. So, having a mix of significant and insignificant correlations among the variables is a normal statistical and logical behavior. As stated in the footnote of the table, the data is presented as r (p -value) which shed a light on the strength of the correlation (r) and its significance. Consequently, no average was supposed to be determined from this data. In literature, there are numerous cephalometric variables which are ever increasing due to the creativity of the scientific community. In our study, 8 vertical variables were evaluated. The assessment of all vertical variables was beyond the scope of this article. The authors thought that these variables were adequate to give an idea on the relationships between the skeletal and dentoalveolar structures in 3D analysis.

A3. The 3D cephalometric analysis proposed in our study aimed to evaluate the patient by helping the clinician decide the best treatment strategy whether limited to orthodontics therapy only or required to include surgery as well. We have already evaluated the basal alveolar arch of the lower dentition from CBCT images in previous studies (Bayome M, Park JH, Han SH, Baek SH, Sameshima GT, Kook YA. Evaluation of dental and basal arch forms using cone-beam CT and 3D virtual models of normal occlusion. *Aust Orthod J* 2013;29:43-51) and (Suk KE, Park JH, Bayome M, Nam YO, Sameshima GT, Kook YA. Comparison between dental and basal arch forms in normal occlusion and Class III malocclusions utilizing cone-beam computed tomography. *Korean J Orthod.* 2013;43:15-22). Therefore, there was no need to repeat the evaluation.

Replied by

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