A study on Arch Widths in Adults with Class I Crowded, Class III Malocclusions and Class I Normal Occlusions in a Bangladeshi Population

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Aims:

1. To compare the arch width measurements of normal occlusion with class I crowded and class III malocclusions in adults.
2. To compare the arch width measurements between males and females.
3. To compare the arch width measurements between class I crowded males and females.

Methods:

- Purposively according to selection criteria, 82 pairs of study models of males and females were selected from the patients and students of the Department of Orthodontics & Dentofacial Orthopedics at Dhaka Dental Collage & Hospital.
- The study casts were handled with extreme care and accuracy. Each cast was checked for accuracy in labial and occlusal views.
- All data were analyzed through standard statistical principles and techniques 3rd ed. St Louis, Mosby; 2000: 29.
- Data collection and processing:
  - Inclusion criteria for Class I group:
    - i. No history of previous orthodontic treatment.
    - ii. Absence of crowding.
  - Exclusion criteria for Class I group:
    - i. Patient with systemic illness.
  - Inclusion criteria for Class III group:
    - i. Patient with history of previous orthodontic treatment.
    - ii. Absence of crowding.
    - iii. Patient with history of previous orthodontic treatment.
  - Exclusion criteria for Class III group:
    - i. Patient with systemic illness.

Results:

<table>
<thead>
<tr>
<th>Group</th>
<th>Maxillary inter-molar width (Mean±SD)</th>
<th>Mandibular inter-molar width (Mean±SD)</th>
<th>Maxillary alveolar width (Mean±SD)</th>
<th>Mandibular alveolar width (Mean±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I crowded males</td>
<td>35.9±2.0</td>
<td>42.4±2.4</td>
<td>59.5±2.6</td>
<td>59.5±4.1</td>
</tr>
<tr>
<td>Class I crowded females</td>
<td>34.8±2.3</td>
<td>40.1±2.4</td>
<td>57.2±2.5</td>
<td>57.2±2.5</td>
</tr>
<tr>
<td>Class III males</td>
<td>35.7±2.9</td>
<td>37.74±2.4</td>
<td>59.5±2.6</td>
<td>59.5±4.1</td>
</tr>
<tr>
<td>Class III females</td>
<td>34.2±2.3</td>
<td>41.4±2.4</td>
<td>53.8±2.8</td>
<td>53.8±2.5</td>
</tr>
<tr>
<td>Class I normal males</td>
<td>35.1±2.5</td>
<td>39.6±2.5</td>
<td>54.4±2.5</td>
<td>54.4±2.5</td>
</tr>
<tr>
<td>Class I normal females</td>
<td>35.7±2.5</td>
<td>39.1±2.5</td>
<td>55.0±2.5</td>
<td>55.0±2.5</td>
</tr>
</tbody>
</table>

Discussion:

- Maxillary inter-molar width was significantly smaller in class I crowded and class III malocclusions as compared to class I normal occlusions. A similar result was observed for maxillary alveolar arch width.
- The inter-molar width of the mandible was significantly larger in class I normal occlusion compared to other groups.
- Maxillary and mandibular arch widths were smaller in class I crowded and class III malocclusions than in class I normal occlusion.

Conclusion:

The hypothesis that there were no differences between adults with class I crowded, class III and class I normal occlusions in respect to maxillary and mandibular arches and gender comparisons was rejected. In comparison of maxillary measurements, the inter-premolar arch width was significantly smaller in class I crowded and class III malocclusions than in class I normal occlusion. In comparison of mandibular measurements, the inter-premolar arch width was significantly larger in class I normal occlusion compared to other groups. Arch widths were found to have significantly smaller in class I crowded and class III malocclusions than in class I normal occlusion. It may be suggested that Orthodontist who is aware of these results can make appropriate treatment decisions.

References:

1. 5-8 The result of this study is in agreement with other similar studies, to establish the origin of Class III malocclusions in a Jordanian sample. Angle Orthod 1994; 16: 47-52.