Estimation of Arch Width in first Permanent Molar Tooth in the Normal Occlusion in Bangladeshi Population

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ABSTRACT

Objective: To estimate the arch width in first permanent molar tooth in the normal occlusion of Bangladeshi population.

Method: This cross sectional study was conducted among the students of Dhaka Dental College & Hospital, Mirpur-14, Dhaka-1206. Total number of subjects were hundred, among them fifty were male and fifty were female. Mean age was 23.3 years. The study was conducted from October-2004 to September-2007.

Results: The inter molar arch width in male upper jaws were 36.15mm, 43.45mm, 53.82mm respectively and in lower jaw these were 27.2mm, 36.01mm and 46.55mm. The transverse values in female upper jaw were 34.01mm, 41.26mm and 51.43mm respectively and in lower jaw these were 26.12mm, 33.84mm and 44.31mm.

Conclusion: The idea of a single arch width could not be substantiated in the study. But the result of the study might help clinicians to define normal arch width and their variations more precisely. However, there are scopes left for the researchers to work further over the issue. (Ban J Orthod & Dentofac Orthop, April 2011; Vol-1, No. 2, 5-8)
RESULTS

This study was conducted among 100 students of Dhaka Dental College & Hospital. The occlusion of these students were normal occlusion. Among them fifty were male students and fifty were female students. The age ranges of this students were from 20 to 25 years.

**Inter molar arch width (mesiobuccal cusp tip):** In upper jaw the mean value in the mesiobuccal cusp tip in case of male was 53.82mm with standard deviation (±) 2.92mm and in lower jaw, mean value was 46.55mm with standard deviation (±) 3.61mm. In case of female, in upper jaw the mean value was 51.43mm with standard deviation (±) 3.07mm and in lower jaw the mean value was 44.31mm with standard deviation (±) 2.74mm.

**Inter molar arch width (from central fossa to central fossa):** The mean value of upper jaw in malesample was 49.18mm with standard deviation (±) 2.14mm and in lower jaw, the mean value was 42.87mm with standard deviation (±) 2.39mm. In case of female, the mean value was 47.58mm with standard deviation (±) 1.99mm and in lower jaw, the mean value was 41.50mm with standard deviation (±) 1.97mm.

**Inter molar arch width (Buccal groove):** The mean value of upper jaw, in case of male was 56.50mm with standard deviation (±) 2.23mm and in lower jaw, the mean value was 49.78mm with standard deviation (±) 2.31mm. In case of female, the mean value was 54.42mm with standard deviation (±) 2.18mm and in lower jaw, the mean value was 47.78mm with standard deviation (±) 1.85mm.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>Mean (mm)</td>
<td>SD (mm)</td>
<td>Mean (mm)</td>
</tr>
<tr>
<td>Upper jaw inter molar arch width from mesiobuccal cusp tip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper jaw male</td>
<td>53.82</td>
<td>±2.92</td>
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<tr>
<td>Lower jaw male</td>
<td>46.55</td>
<td>±3.61</td>
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**Position wise inter molar arch width mesio-buccal cusp tip first molar (L66)**

Fig 1: Position wise inter molar arch width - mesio-buccal cusp tip first molar

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<tr>
<th>Parameter</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>Mean (mm)</td>
<td>SD (mm)</td>
<td>Mean (mm)</td>
</tr>
<tr>
<td>Upper jaw intermolar arch width from central fossa to central fossa</td>
<td>49.18</td>
<td>±2.14</td>
</tr>
<tr>
<td>Lower jaw intermolar arch width from central fossa to central fossa</td>
<td>42.87</td>
<td>±2.39</td>
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**Fig. 2: Intermolar Arch width central fossa**

**Table III: Inter molar arch width (Buccal groove molar):**

<table>
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<tr>
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<th>Female</th>
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<tr>
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<td>Lower jaw intermolar arch width</td>
<td>49.78</td>
<td>±2.31</td>
</tr>
</tbody>
</table>

**Fig. 3: Position wise inter molar arch width (buccal groove molar)**
DISCUSSION

This cross sectional type of study was conducted in the Department of Orthodontics and Dentofacial Orthopedics, Dhaka Dental College and Hospital, Mirpur - 14, Dhaka, to estimate arch width in molar region in normal occlusion. The subject of this study was selected from students of Dhaka dental college. This study correlated with the previous study conducted among the Saudi and Egyptian population sample. This study was also correlate with the study result found among the Indonesian's sample. But, this result was significantly lower than the Australian aborigines sample with same criteria. This may be due to diet, environmental factors, or physical characteristics that present in the population.

The first molar I arch width along the mesiobuccal cusp tip on the occlusal surface in male upper jaw was 38.39± 2.06mm and in lower jaw this value was 46.55± 3.61mm and in case of female this was 44.31± 2.74mm . This result was significantly lower than the Australian aborigines and Indonesian sample. All the arch width along the permanent first molar both in upper and in lower jaw were greater in male sample than in female samples. These values were lower than the previous study done on American black and white population.

CONCLUSION

The idea of a single arch width could not be substantiated in these sample of untreated adults with a normal occlusion. But the results obtained from this preliminary study may be regarded as a milestone in the field of Orthodontic research in Bangladeshi context, which might help the Orthodontists, researchers and relevant practitioners for an effective clinical decision. The Orthodontist who is cognizant and aware of these possible differences while evaluating arch width, will be better prepared to diagnosis and plan treatment more accurately. However, further similar studies are recommended to establish the validity of the work.

REFERENCES


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