

Comparison on Intermolar width among Different types of Malocclusion of Bangladeshi Population

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Abstract :

Objectives :

To compare inter-molar width of different classes of dento-alveolar malocclusion in the permanent dentition.

Materials and Methods :

This study was done at Department of Orthodontics , BSMMU between 1st July 2007 to 1st January 2011 .96 study patient was selected . inter-molar width were measured from dental casts of this Bangladeshi subjects of which 48 male, 48 female, 24 class 1, 24 class 2 div. I, 24 class 2 div. II, 24 class III. A slide calipers with a vernier scale was used to measure the inter-molar width and compared among different malocclusion classes.

Results :

Intermolar width in maxilla was found maximum in class I malocclusion but Intermolar width in mandible was maximum in class III malocclusion . Least significant difference (LSD) is used to compare two of the four group . $P < 0.05$ was set as the level of significance.

Conclusions :

Statistically significant difference ($p=0.0018$) was found when the results is compared among the four malocclusion groups (Table 4). No group showed any significant difference except Class I and Class III, Class II div.1 and Class III, Class II div. 2 and Class III, when compared individually using LSD test (Table 3).

Introduction :

Dental arch forms have considerable implications in orthodontic diagnosis and treatment planning, as it affects the space available, dental aesthetics, and stability of the dentition. These considerations, in association with the antero-posterior movements of the dentition, will determine the requirements for extraction or non extraction treatment [1]. Arch width have been used to provide estimations of arch form. [2]. Arch width is measure by estimation intermolar width [3].

Very few information are available about dental arch dimen-

sions of permanent dentition in Bangladeshi population.

In a study in our country, ideal arch form, arch width and arch length in normal occlusion group of 100 (50 males and 50 females) Bangladeshi subjects and auther found that in maxilla intermolar width is 49.18mm in male and 47.58mm in female [4] The literature review indicates that many investigators found differences intermolar width in different types of malocclusion , as a result, a comparative study was required to standardized the arch dimension of permanent dentition of Bangladeshi population .

Specific Objectives:

To compare the intermolar width on the dental cast among dento-alveolar Class I, Class II and Class III malocclusion groups.

Materials and Methods :

This study was done at the Department of Orthodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University from 1st July 2007 to 1st January 2011 with a sample size of 96 patients. At first study model was prepared with stone plaster pouring it into impression of maxillary and mandibular arch . Patients detail is collected from departmental record book Then data of this study is measured with slide calipers and 0.5 mm brass wire and recorded in the data collection sheet.

Data collection procedure:

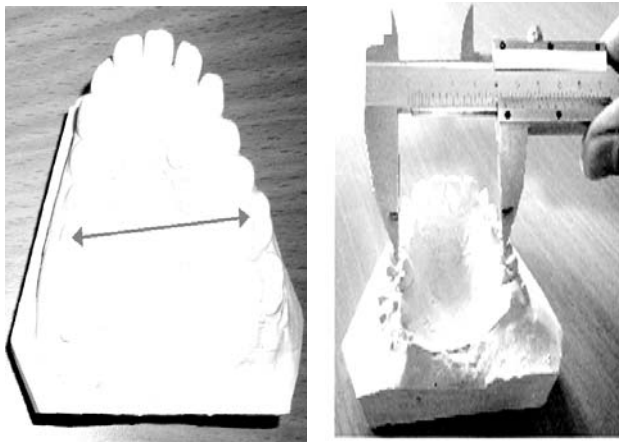


Figure 1: Measurement of intermolar width

Molar arch width- horizontal distance between the central fossae of right and left first permanent molars [4]

Data analysis:

The variable of this study are Mandibular inter-molar width (man IMW), maxillary inter-molar width (maxi IMW). Data of this study are computerized and analyzed using SPSS for window version 10, strata version 10. One –way analysis of the variables (ANOVA) is used to check the statistical significance of the variables among Class I, Class II division 1, Class II division 2, Class III malocclusions. Least significant difference (LSD) is used to compare two of the four group . P<0.05 is set as the level of significance.

Results :

Table 1: Distribution of subjects according to gender and malocclusion groups

Malocclusion group	Number of males	Number of females	Total
Class-I	12	12	24
Class-II division 1	12	12	24
Class-II division 2	12	12	24
Class-III	12	12	24
Grand total	48	48	96

Mean and standard deviation (descriptive statistics) of different variables Mandibular IMW, Maxillary IMW) compared in this study are given in Table.2

Table 2: Mean intermolar in four malocclusion groups

Inter molar width	Class-I		Class-II division 1		Class-II division 2		Class-III	
	Mean	SD±	Mean	SD±	Mean	SD ±	Mean	SD ±
Mandibular IMW	39.87	1.15	40.16	2.14	40.89	1.39	41.22	1.33
Maxillary IMW	43.52	1.34	43.49	1.49	43.38	1.36	42.15	1.36
Mandibular inter-molar width =man IMW, maxillary inter-molar width =maxi IMW								

Table 4: Comparison of maxillary and mandibular intermolar width among four malocclusion groups (n=96)

Dimensions	Class	No of patients	Mean	SD ±	P-value
Mandibular IMW	I	24	39.87	1.15	0.0109*
	II div 1	24	40.16	2.14	
	II div2	24	40.89	1.39	
	III	24	41.22	1.33	
Maxillary IMW	I	24	43.52	1.34	0.0018*
	II div 1	24	43.49	1.49	
	II div2	24	43.38	1.36	
	III	24	42.15	1.36	
P-value less than 0,05 is significant					
Mandibular inter-molar width =man IMW, maxillary inter-molar width =maxi IMW,					

Table 3: Comparison of maxillary and mandibular inter-molar width between individual malocclusion groups

Inter-molar width	Class-I vs Class-II div 1 (P-value)Class	Class-I vs Class-II div 2 (P-value)	Class-I vs Class-III (P-value)	Class-II div1 vs. Class-II div 2 (P-value)	Class-II div1 vs. Class-III (P-value)	Class-II div 2 vs. Class-III (P-value)
Mandibular IMW	.517	.025	.003	.108	.020	.454
Maxillary IMW	.934	.726	.001	.789	.001	.003
P-value less than 0.05 is significant						
Mandibular inter-molar width =man IMW maxillary inter-molar width =maxi IMW						

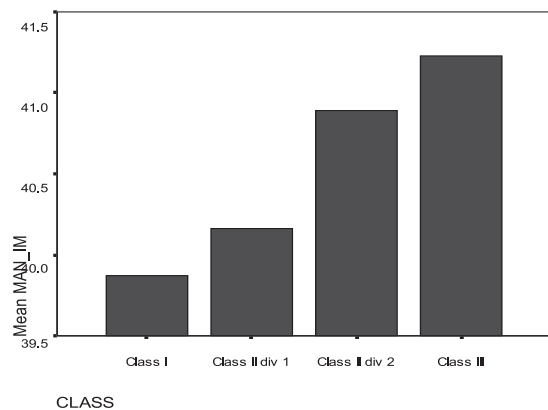


Figure 2: Bar diagram of mean mandibular intermolar width of four groups of malocclusions.

Mandibular Intermolar Width:

Class I group showed highest mean mandibular intermolar width followed by Class III, followed by Class II div 2, while the lowest value was noted for Class I group. The difference in mandibular intermolar widths among the four groups was found to be significant ($p = 0.0109$) as shown in Table 4. No two individual groups showed significant difference except Class-I and Class II div 2, Class I and Class III, Class II div 1 and Class III (Table 3), implying that mandibular arches were more constricted in Class I group than in class III malocclusion

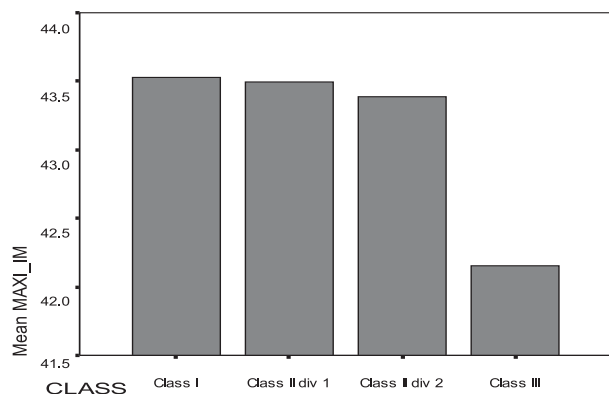


Figure 3: Bar diagram of mean maxillary intermolar width of four groups of malocclusions.

Maxillary Intermolar Width:

The highest mean intermolar width was noted for Class I followed by Class II div 1, followed by class II div 2 malocclusion group with the least width found for class I malocclusion (Table 2 and Figure 3). However, statistically significant difference ($p=0.0018$) was found when the results is compared among the four malocclusion groups (Table 4). No group showed any significant difference except Class I and Class III, Class II div 1 and Class III, Class II div 2 and Class III, when compared individually using LSD test (Table 3).

Discussion :

Mandibular intermolar width was compared among the different groups of malocclusion and found significant difference (p value=0.0109) but this result was different with study done by some other [5,6]. In this study we found class III malocclusion has maximum intermolar width and it was also found in the another study [7]

Maxillary inter-molar width was compared among four groups of malocclusion in this study and we found there was significant difference (p value=0.0018) between them. When individual group is compared significant difference was also found between Class I and ClassIII (p value=0.001), ClassII div.1 and ClassIII (p value=0.001), Class II div 2 and ClassIII (p value=0.003). It was found that Class I malocclusion has is greater than class II malocclusion. Similar result was found in a study by another author [8]

Conclusion :

In different types of malocclusion of permanent dentition, intermolar width is measured on maxillary and mandibular dental casts. From the result, it may be concluded and suggested that

1. Class III malocclusion has maximum mandibular intermolar width. It suggested that growth in transverse plane in class III is more than normo-occlusion . It was also found that class I malocclusion show minimum mandibular intermolar width.
2. Maxillary intermolar distance is widest in class I malocclusion . It is narrowest and frequently associated with posterior cross bite in class III malocclusion.

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