Original Article

Assessment of malocclusion pattern in Bangladeshi Population.

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Abstract:

Background: Malocclusion is one of the most common dental problems together with dental caries, gingival disease, dental fluorosis which varies in different part of the world among different populations. The aim of this study was to assess the malocclusion pattern in Bangladeshi population to provide quantitative information regarding the pattern of dentofacial characteristics.
Methods : This cross sectional study was carried out with the orthodontic records of 256 patients who attended and treated in the Department of Orthodontics ,Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital , Dhaka. Malocclusion pattern mainly assessed by Angle's classification system; along with incisor classification system other variables like overjet, overbite, cross bite ,crowding, spacing and median diastema were recorded. Finally data were analyzed by using SPSS software (Version 21).
Results : The study result showed out of 256 orthodontic patients majority (68.7%) were female, in Angle's classification Class I malocclusion was the most prevalent (55.5%) type of malocclusion followed by Class II (38.3%) and Class III (6.3%). The most prevalent malocclusion trait found crowding (67.7%), followed by increase overjet (65.6%), increase overbite or deep bite (50.4%); the least prevalent malocclusion trait found scissor bite (1.2%) followed by posterior cross bite (5.1%) and median diastema (12.5%). Statistical significant relationship observed in the distribution of malocclusion by Angle's classification with sex (as p value < .05).
Conclusion: This hospital based study concludes that in Angle's classification system: Class I malocclusion was prevalent along with the malocclusion trait crowding, which actually gives a general idea about the malocclusion pattern in Bangladeshi population.

Key words: Malocclusion, Crowding, Cross bite, Overbite, Overjet, Orthodontics .

INTRODUCTION:

Malocclusion may be defined as an improper relationship between the teeth in the opposite jaws or an irregularly of the teeth beyond the accepted range of normal, which has been a prevalent disorder in recent decades. [1] It is considered as one of the most common dental problems together with dental caries, gingival disease and dental fluorosis.[2] The prevalence of malocclusion varies in different parts of the world among different populations, it is an important determinant in planning appropriate levels of orthodontic treatment.[3] Knowledge about the distribution of different patterns malocclusions may help orthodontic practitioners in a better understanding of the extent of malocclusion problem in a geographic location and help them in the proper orientation and management of treatment possibilities.[4] As well as the knowledge about the prevalence and severity of malocclusion is important for early diagnosis and planning of orthodontic services. The present study was aimed to assess the malocclusion pattern in Bangladeshi population to provide quantitative information regarding the pattern of dentofacial characteristics.

MATERIALS AND METHODS :

This cross sectional study was carried out with the orthodontic records of 256 patients who attended and treated in the

Department of Orthodontics ,Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital , Dhaka were taken as the study population. All the patients were self referred and those who had history of previous orthodontic treatment, craniofacial deformities or syndrome, systemic disease, missing first molar, extensive carious lesion in permanent teeth were excluded from this study. Ethical clearance was obtained from the institutional ethical committee of BSMMU. Data were collected from written case records and dental casts of orthodontic patients with the help of simple divider, brass wire, metallic ruler and clinical examination was carried out by using a mouth mirror, probe, small light source with an assistant. The occlusal anterior posterior relationships were assessed by using Angle's classification, which is a qualitative method of recording occlusal traits.[5] This method is widely used, as well as useful method for easy documentation and provides a common channel of communication among dental practitioners. According to this classification Class I malocclusion considered as when the mesio-buccal cusp of the maxillary first permanent molar occluded with the anterior buccal groove of the mandibular first permanent molar on both sides. In Class II and Class III malocclusion molar relationship recorded as, when the mesio-buccal cusp of the maxillary first permanent molar occluded at least half a cusp width anterior or posterior to the anterior buccal groove of the mandibular first permanent molar on both sides, respectively. Based on incisor relationship malocclusion; classified as Class I, Class II division I, Class II division II and Class III   Incisor classification, which is more helpful in clinical practice than the Angle's classification.[6] Other variables examined in this study were overjet, overbite, crowding, crossbite, spacing and median diastema. The overjet which is the the horizontal distance in millimeters between the labial surfaces of the maxillary and mandibular central incisors considered normal as 2 – 3 millimeter, and the overbite was considered normal if the maxillary central incisors overlapped the incisal third of the crown of mandibular central incisors. Crowding and spacing were assessed by subtracting the sum of mesio-distal width of teeth in an arch from arch perimeter. The value is negative in crowding and positive in spacing. Cross bite was assessed by evaluating the transverse relationship of the upper and lower jaw. Posterior cross bite was considered when the buccal cusp of the upper teeth (at least two neighboring tooth) occlude lingual to the maximum height of the buccal cusp of the opposing lower tooth. Scissor bite was recorded when the lingual cusp of the upper tooth occluded buccal to the maximum height of the buccal cusp of the opposite tooth.[7] Posterior cross bite and scissor bite were registered as bilateral, right and left.[8-9] Maxillary median diastema was recorded when a space of 2 mm or more existed between the maxillary central incisors.[7] Finally data were analyzed by using SPSS software (Version 21) on the basis of different variables.

RESULTS :

Table 1: Age distribution of the patients

Age (in years)	Frequency	Percentage
Mean±SD	17.9(±5.9) year, Range : 7 - 36 years	
<12	39	15.2
12-17	82	32
>17	135	52.7
Total	256(100.0)	

Table 1 shows the mean age of the patients was 17.9 (±5.9) years with range 7-36 years, more than half (52.7%) patients were in > 17 years age group.

Figure 1 : Sex distribution of the patients [n=256]
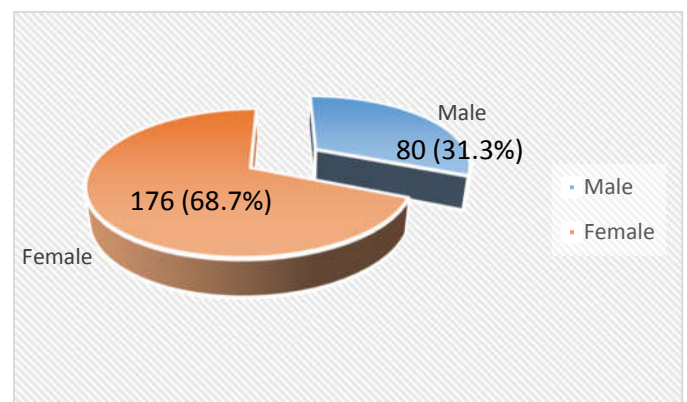

Figure 1 shows out of 256 patients 68.7% were female and 31.3% were male.

Table 2 : Distribution of malocclusion by Angle's and incisor classification

Angle's classification	n=256		Incisor Classification	n=256	
	Frequency	Percentage		Frequency	Percentage
Class I	142	55.5	Class I	101	39.5
Class II	98	38.3	Class II: division I	113	44.1
Class III	16	6.3	Class II: division II	11	4.3
			Class III	31	12.1

Table 2 shows out of 256 patients, Class I malocclusion found in more than half (55.5%) patients, followed by 38.3% patients were Class II and 6.3% patients were diagnosed as Class III malocclusion. According to incisor classification Class II: division I malocclusion diagnosed in   majority (44.1%) patients , followed by Class I in 39.5% and Class III, Class II: division II in 12.1% and 4.3% patients respectively.

Table 3 : Distribution of malocclusion with different variables

Variables		n (%)
Overjet	Normal	60 (23.4)
	Increase	168 (65.6)
	Decrease	28 (10.9)
Overbite	Normal	93 (36.3)
	Increase	129 (50.4)
	Decrease	34 (13.3)
Cross bite	Absent	240 (93.7)
	Posterior cross bite	13 (5.1)
	Scissor bite	3 (1.2)
Crowding	Present	173 (67.7)
	Absent	83 (32.3)
Median diastema	Present	32 (12.5)
	Absent	224 (87.5)
Spacing	Present	83 (32.3)
	Absent	173 (67.7)

Above table shows the increase overjet and overbite values were highest in 65.6% and 50.4% patients respectively. In majority (93.7%) patients cross bite was absent, but posterior cross bite and scissor bite found in 5.1%, 1.2% patients respectively.

Table 4 : Distribution of Angle's malocclusion according to sex

Sex	Angle's classification		
	Class I	Class II	Class III
	n (%)	n (%)	n (%)
Male	36 (23.4)	38 (38.8)	6 (37.5)
Female	106 (76.6) *	60 (61.2) **	10 (62.5)
Total	142 (100.0)	98 (100.0)	16 (100.0)

p-value calculated by chi square test
* p value <0.05, **p value < 0.01

Above table shows statistical significant difference observed in the distribution of malocclusion by Angle's classification between male and female. Also Class I malocclusion was significant in female (p value < 0.05) and Class II malocclusion was highly significant in female (p value < 0.01)

DISCUSSION:

Present study assessed the malocclusion pattern among the Bangladeshi patients seeking for orthodontic treatment to provide quantitative information regarding the pattern of dentofacial characteristics. According to the study result majority (68.7 %) orthodontic patients were female, which supports the study results[10-12], the reason behind this may be female are more concern about aesthetic issues than male. Regarding the malocclusion pattern present study result found that according to Angle's classification Class I malocclusion was the most prevalent type of malocclusion with 55.5 % , 38.3 % Class II and 6.3 % Class III among the examined Bangladeshi orthodontic patients, which was consistent with other studies reported by Rita SN et al.[10], Rahman MM et al.[13], and inconsistent with the studies [14,15] in India and [16] in Pakistan. In case of incisor classification, Class II division I malocclusion had the highest frequency (44.1%) followed by Class I (39.5%), Class III (12.1%).Distribution of different types of malocclusion may show a great variability even in a population of same origin.[11] Regarding other variables present study showed crowding (67.7%) was more frequent than spacing (32.3%) which was similar to the findings in Pakistani population reported by Erum GE et al. [17] Statistical significant difference observed in the distribution of malocclusion by Angle's classification between male and female, also female patients presented with high number of Class I and Class II malocclusion with significance value (p value < 0.05), which was inconsistent with the study conducted by Onyeaso C O et al.[18], where they showed that male have significantly more Class II and Class III molar relationship than female.

CONCLUSION :

This hospital based study shows that in Angle's classification: Class I malocclusion was prevalent along with the most prevalent malocclusion trait crowding, which actually gives a general idea about the malocclusion pattern in Bangladeshi population. Identifying occlusal problems and their incidence can help to determine the appropriate treatment plan and manpower needed in orthodontic services. But further studies are required to provide accurate estimates of the orthodontic treatment need in Bangladeshi population.

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