

Common Malocclusion Problems and their Management: A Hospital based study

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Abstract :

Aims: Orthodontics is the branch of dentistry concerned with the prevention, interception and correction of malocclusion. The present study aimed at the common malocclusion problems and their management in Bangladeshi population. It was also aimed to align for aesthetics reason, functional efficiency and structural balance.

Methods: A cross-sectional study was carried out among 120 respondents having malocclusions. Students, especially young women and urban residents were selected as the main respondents of our series which reflected its aesthetic value against malocclusion

Results: Mean age of the respondents was 22.22±9.07 years with a male and female ratio of 1:3.1. Among the respondents, 37.5% were within the 11 to 20 years age group with a past (21.0%) and present (7.5%) history of finger sucking habit and abnormal over jet (71.7%) and over bite (55.8%). Mean over jet and overbite were 4.4 ±3.47 (range, -2 to 12) mm and 3.47±1.98 (range, 0 to 7) mm, respectively. Angle's classification revealed type 1, type 2 (division 1), type 2 (division 2) and type 3 were 55.0%, 28.3%, 3.3% and 13.3%, respectively, and based on skeletal relationships, type 1, type 2 and type 3 were 64.2%, 25.0% and 10.8%, respectively. Of all patients, 66.7% had convex, 22.5% straight and 10.8% had concave face profiles. They also had 44.2% competent, 36.7% incompetent and 19.2% habitual competent anterior lip seals.

Conclusions: Smile is a global language though many of our patients are deprived of both socially and economically, especially young women from this language. With growing importance imposed on preventive orthodontic treatment and proper oral health education, incidence of malocclusion can be reduced.

Key words: Malocclusion, abnormal oral habits, prevention, management.

Introduction:

Malocclusion means significant deviation from ideal's occlusion. Malocclusion is the most common reason for referral to an orthodontist. However, most occlusion problems are so minor that they do not require treatment. By treating moderate or severe malocclusion, the teeth are easier to clean and there is less risk of tooth decay and periodontal diseases (gingivitis or periodontitis). Treatment eliminates strain on the teeth, jaws and muscles, which lessens the risk of breaking a tooth and reduces symptoms of temporomandibular joint disorders. Dentists who are

especially trained to correct malocclusion are called orthodontists. They use a variety of treatment tools and techniques (including braces) to move teeth, and sometimes the jaw, into the right places.^{1,4,5}

Malocclusion is most often hereditary.² There may be a disproportion between the size of the upper and lower jaws or between jaw and tooth size resulting in overcrowding of teeth or in abnormal bite patterns. Extra teeth, malformed teeth, impacted or lost teeth, and teeth that erupt in an abnormal direction may contribute to malocclusion.

Variations in size or malformation of either jaw may affect its shape, as can birth defects such as cleft lip and palate. During infancy, personal habits like finger sucking tongue thrusting, pacifier use beyond the age of three, and prolonged use of a bottle can greatly affect the shape of the jaws as well. The improper fit of dental fillings, crowns, appliances, retainers or braces may contribute to malocclusion. Misalignment of jaw fractures after a severe injury, and tumors of the mouth or jaw may cause malocclusion as well.^{2,4,7}

Whenever possible, it is best to diagnose and treat malocclusion at a young age, when the bone is still soft and teeth can be moved more easily. Malocclusion may be treated in steps in children so that each therapy coincides with a child's level of growth and development. However, treatment is often successful at any age. Malocclusion typically is treated using fixed or removable appliances, or a combination of both.⁶ Fixed appliances are known as braces, and they are the most common form of treatment for malocclusion. Braces involve moving the teeth into proper position through a system of brackets and wires that pressures teeth to shift in a certain direction.⁶ Removable appliances are composed of wires attached to a plastic base and can be removed by the patient. For example, a patient may be asked to wear a retainer that can be removed. Head and neck gear are other examples of removable appliances. This gear has wires that attach inside the mouth. These devices typically are used in situations when extra tension is needed to straighten out a patient's teeth or jaw. The success of these devices is highly dependent upon the patient's willingness to closely follow a dentist's or orthodontist's treatment plan. Regardless of the treatment method, careful adherence to the recommended schedule for brushing and flossing is essential for success and the prevention of complications.⁶ Other treatments for malocclusion include adjusting, reshaping, bonding or capping rough or irregular teeth. If dental restoration work is the source of the malocclusion, the restoration may have to be fixed or replaced. In some cases, surgery may be necessary to correct malocclusion. This is particularly true of adults, who may have skeletal problems that cannot be corrected without jaw surgery. Surgery may include procedures to lengthen or shorten the jaw (orthognathic surgery) and wires, plates or screws may be used to stabilize the jaw bone. In some situations, a child may have selected primary teeth removed so that permanent teeth will erupt into proper position.⁴ Certain dental appliances may be necessary to facilitate this process. The decision to remove permanent teeth must be made with special care.^{4,6} Dental problem is very common in Bangladesh. This study was conducted to find out the common malocclusion problem, their management and cost of treatment in Bangladeshi population.

Materials and Methods:

This was a descriptive type of cross-sectional study conducted among 120 patients who were attending the department of orthodontics at Dhaka Dental College hospital from January 2008 to June 2008. Purposively the author took his place and selected the number of subjects. A pre-designed semi-structured questionnaire and a check list were developed keeping the objectives and variables. The data were collected by self-administered using structured questionnaire through direct face-to-face interview and by observation of the respondents after obtaining verbal consent. Collected data were checked, verified and only the fully completed questionnaires were recorded in the computer for final analysis with the help of SPSS (version 17.0) and based on the key variables.

Results:

Table-1 shows the highest numbers (37.5%) of respondents were within the 11 to 20 years age group. Among others, 32.5% of the respondents were in the age group of 21 to 30 years, 16.7% 31 to 40 years, 8.3% up to 10 years and 5.0% above 40 years of age group. Mean age of the respondents was 22.22±9.065 years with a male (24.2%) and female (75.8%) ratio of 1:3.1 (fig.1). Of all respondents, 55.0% had type 1, 28.3% type 2 (division 1), 3.3% type 2 (division 2) and 13.3% had type 3 malocclusions according to Angle's classification (table-2). Among all, 39.2% respondents had crowding, 60.8% proclination, 26.7% spacings, 27.5% median diastema and 19.2% had abnormal frenal attachments (table-3). In cases having normal overbites, 92.5% had type 1, 1.9% type 2 (division 2) and 5.7% had type 3 malocclusions. Respondents with abnormal over bites, 25.4% had type 1, 50.7% type 2 (division 1), 4.5% type 2 (division 2) and 19.4% had type 3 malocclusions (table-4). Table-5 delineates that the cases with normal over jets: all had type 1 malocclusions whereas, with abnormal over jets, 38.6% had type 1, 38.6% type 2 (division 1), 4.5% type 2 (division 2) and 18.2% had type 3 malocclusions. Majority respondents (66.7%) had convex, followed by 22.5% straight and 10.8% had concave face profiles (table-6). Treatment options included removable (63.3%), fixed (25.0%), combination of both removal and fixed (9.2%) and myofunctional (2.5%) appliances (table-7).

Table-1: Distribution of the Respondents by age. [n=120]

Age group (years)	Number	Percent (%)
10	10	8.3
11-20	45	37.5
21-30	39	32.5
31-40	20	16.7
>40	6	5.0
Total	120	100.0

Mean (±SD) = 22.22±9.065

Figure-1: Distribution of the Respondents by gender. [n=120]

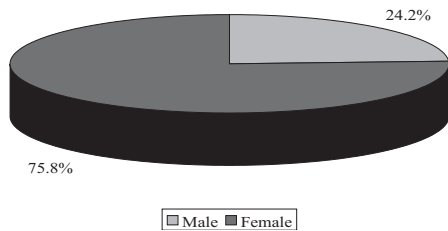


Table-2: Distribution of the Respondents by type of malocclusion (Angle's classification). [n=120]

Type	Number	Percent
Type 1	66	55.0
Type 2 (division 1)	34	28.3
Type 2 (division 2)	4	3.3
Type 3	16	13.3
Total	120	100.0

Table-3: Distribution of the respondents by characteristics of malocclusion. [n=120]

Characteristics of malocclusion	Number	Percent
Crowding		
• Present	47	39.2
• Absent	73	60.8
Proclination		
• Present	73	60.8
• Absent	47	39.2
Spacing		
• Present	32	26.7
• Absent	88	73.3
Median Diastoma		
• Present	33	27.5
• Absent	87	72.5
Abnormal frenulum attachment		
• Present	23	19.2
• Absent	97	80.8

Table-4: Association of type of malocclusion and overbite. [n=120]

Type of malocclusion (Angle's classification)	Overbite	
	Normal	Abnormal
Type 1	49 (92.5)	17 (25.4)
Type 2 (division 1)	-	34 (50.7)
Type 2 (division 2)	1 (1.9)	3 (4.5)
Type 3	3 (5.7)	13 (19.4)
Total	53 (100.0)	67 (100.0)

Table-5: Association of type of malocclusion and overjet. [n=120]

Type of malocclusion (Angle's classification)	Over jet	
	Normal	Abnormal
Type 1	32 (100.0)	34 (38.6)
Type 2 (division 1)	-	34 (38.6)
Type 2 (division 2)	-	4 (4.5)
Type 3	-	16 (18.2)
Total	32 (100.0)	88 (100.0)

Table-6: Distribution of the Respondents by face profile. [n=120]

Face profile	Number	Percent
Concave	13	10.8
Convex	80	66.7
Straight	27	22.5
Total	120	100.0

Table-7: Distribution of the Respondents by treatment option. [n=120]

Treatment option	Number	Percent
Removable appliance	76	63.3
Fixed appliance	30	25.0
Combination of both	11	9.2
Myofunctional appliance	3	2.5
Total	120	100.0

Discussion:

In this study, mean age of the respondents was 22.22±9.07 years. Highest numbers (37.5%) respondents were within 11 to 20 years age group. Among others 32.5% of the respondents were in age group 21 to 30 years, 16.7% within 31 to 40 years, 8.3% up to 10 years age and 5.0% above 40 years age group. Male and female ratio was 1:3.1 (table-1). The present study aimed at the common malocclusion problems and their management in Bangladeshi population. Students, especially young women and urban residents were selected as the main respondents of our series which reflected its aesthetic value against malocclusion.

There are no direct evidence that female were suffered from malocclusion than male. It may be due to aesthetic purpose and was supported by more female (75.8%), more students (60.8%), more young age group that was 11 to 30 years (70.0%), literate (96.7%) and urban respondents (60.8%) of the study population series. Middle (50.0%) and higher (24.2%) income group respondents were attended more as for costly treatment procedure (data is not shown).

In Murshid et al.⁵ series, moderate and severe overjet and overbite accounted for 24.0% & 5.0% and 27.0% & 13.0%, respectively. In Katri et al.⁶ series, overjet was ranged from -2 to +10 mm with a mean of 2.9 mm. Overbite ranged from -5 to +8 mm with a mean of 2.8 mm. Excessive (≥ 4 mm) overjet was found in 26.7% and overbite in 33.8% of the children; in 15.5% of the children, both variables were 4 mm or more. In this study, 28.3% had normal and 71.7% had abnormal overjet, 44.2% had normal and 55.8% had abnormal overbite (table-4 & 5). Mean overjet was 4.4 ± 3.47 mm with a range from -2 to 12 mm and mean overbite was 3.47 ± 1.98 with a range from 0 to 7 mm (table-4 & 5). In Steigman et al.⁷ series on 803 children, of whom 2.5 percent were under orthodontic treatment at the time of the study and 0.3 percent showed ideal occlusion. The remainder showed various measures of deviation from normal, distributed as follows: 85 percent had Angle Class I malocclusion, 8.5 percent Class II division 1 malocclusion, 1.7 percent Class II division 2 and 1.3 percent belonged to the Class III categories. In Saleh³ series, 59.5% had malocclusions, 35.5% of which were of dental origin and 24% had skeletal discrepancy (19% Class II and 5% Class III malocclusions). The present study revealed that out of all respondents with normal overjets based on the Angle's classification, all had type 1 malocclusions and with abnormal overjets, 38.6% had type 1, 38.6% type 2 (division 1), 4.5% type 2 (division 2), 18.2% had type 3 malocclusion (table-2). In this series, prevalence of type 1, type 2 (division 1), type 2 (division 2) and type 3 was 55.0%, 28.3%, 3.3% and 13.3%, respectively, and according to skeletal relation, type 1, type 2 and type 3 was 64.2%, 25.0% and 10.8%, respectively (table-2).

Among all respondents, 39.2% had crowdings, 60.8% proclination, 26.7% spacing and 27.5% had median diastemas. Out of all respondents, 19.2% had abnormal frenal attachments (table-3). Out of all respondents, 68.3% had no cross bite, 24.2% anterior, 5.0% posterior (unilateral) and 2.5% had posterior (bilateral) cross bites. Besides these, 10.8% had open bite and 89.2% had not (data is not shown). Majority (63.3%) respondents had removal appliances as treatment option followed by 25.0% had fixed appliances, 9.2% combination of both removal and fixed appliances and 2.5% had myofunctional appliances that agreed with the study of Katri et al.⁶.

Conclusions:

Oral health has made remarkable progress in most developed countries as a result of prevention program. However, the situation is beginning to deteriorate in many developing countries, where oral diseases are on the increase. The smile is a global language but many of our patients are deprived of both socially and economically especially young women from this language. With growing importance imposed on

prevention and treatment of oral and dental disease specially malocclusion, adoption of preventive measure and proper oral health education, incidence of malocclusion can be reduced significantly. But the incidence is increasing in oriental populations. We can do much about avoiding costly orthodontic treatment by interceptive and preventive treatment.

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