Prevalence of Dental Health Problems among the Patients Attending in the Orthodontic Department of Dhaka Dental College & Hospital

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ABSTRACT

Objectives: To know the prevalence & pattern of dental health problems among Bangladeshi people.

Study design: Descriptive cross sectional study.

Place of study: Department of Orthodontics & Dentofacial Orthopaedics of Dhaka Dental College & Hospital, Dhaka.

Period of study: From September'2011 to February'2012.

Sample selection: In this study, A total number of 500 patients   (250 males & 250 females) were selected from Orthodontic Department of Dhaka Dental College & Hospital.

Results: This was a cross sectional study conducted among 500 patients in the Department of Orthodontics and Dentofacial Orthopaedics, Dhaka Dental College and Hospital. Gingivitis is the commonest problem in Bangladeshi people according to present study. The second most dental problem is dental caries. The prevalence of orthodontic problems was comparable to the observations made by others. Males and females are equally affected with slight variations in the nature of problems among both genders.

Conclusion: Good oral health is essential to improve individual overall health & well-being. We urge to take this information & use it for program planning & advocating for the health of patients, specially for the patients who will receive orthodontic treatment. Therefore, current orthodontic students should receive more education & training before the management of malocclusion to improve the overall quality of care for orthodontic patients.

Key wards: Dental health, caries, gingivitis, inflammation, periodontitis (Bangladesh Journal of Orthodontics and Dentofacial Orthopedics, October 2012, Vol. 3, No. 1, p 17-23

INTRODUCTION

Public Dental Health has been defined as "The science and art of preventing and controlling dental disease and promoting dental health through community effort" by American Dental Association[1]. The unique characteristic of dental diseases is that they are universally prevalent and do not undergo remission or termination if untreated and require technically demanding expertise and time consuming professional treatment. According to G. Dale if deciduous teeth are retained beyond time of exfoliation, they are known to cause delay in eruption of permanent teeth and thus lead to malocclusion and other orthodontic problems, which will then need expensive corrective measures[2]. More than 400 species of bacteria live in human mouth. Dr. Robert Genco points out that serious gum infection can release bacteria in the blood stream and can worsen the condition of patient suffering from heart disease, stroke and other similar ailments[3]. It is also known that periodontal diseases can even cause premature labour by release of prostaglandins by periodontal bacteria and also worsen conditions like diabetes and pneumonia.

This study was an attempt to assess the prevalence of four dental diseases- dental caries, gingivitis, retained deciduous teeth & fractured teeth among the patients attending in the Orthodontic department in Dhaka Dental College & Hospital, Bangladesh.

Various reports[4,5,6] have been published about the prevalence & incidence of malocclusion & treatment facilities at Dhaka Dental College & Hospital. However, no study so far had been made over prevalence of dental health problems among the people in our country. So, we did not know about the prevalence & pattern of dental health problems among the

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patients attending in the Orthodontic department in Dhaka Dental College & Hospital. In a developing country like Bangladesh preventive measures should be the most important concern to mitigate the occurrence of dental health problems so as to void complicated and expensive dental treatment.

To provide oral health planners in Bangladesh with information on the prevalence & pattern of dental health problems among the patients attending in the Orthodontic department in an attempt to define the target population for orthodontic services in future. It may forecast to initiate a nationwide dental health status & establish nationwide treatment strategy of different dental health problems.

Dental caries is the most common dental disease with high prevalence in humans. It is crucial to control the disease process by assessing and rendering the treatment required along with spreading awareness regarding prevention. Several prevalence studies have been conducted and reported on different occasions about dental caries and the treatment needs in developing countries. However, not much data is available on the prevalence of dental caries and the treatment needs in children. One of the main etiological factors of the appearance of periodontal diseases is the collection of the microbe pad on the periodontal edge, bed or recess. Resistance of periodontal webs to microbes depends on many local and general factors. Hyperergical reactions to bacteria belong to the immune mechanisms: anafilacsium and oversensitivity, reactions of immune complexes, and cytotoxic reactions[7-9]

Systematical factors are related to the general health of an organism, they influence periodontitis (e.g. endocrine factors, disorders of nutrition or its insufficiency, effects of medicine, psychological or emotional factors, inheritance, metabolic factors and hematological diseases)[9-11]

Malocclusion is one of the commonest aesthetic problems in Bangladesh. According to Hossain MZ,[4] Class I malocclusion patient was 55.22%, Class II was 33.33% (Class II div 1 was 28.85 % and Class II div 2 was 4.48 %), Class III was 8.46% open bite 0.99% and other nonspecific case 2% who were attending Dhaka Dental college in the department of Orthodontics in the year of 1990 - 1991. According to Ahmed N,[5] Class I malocclusion patient was 45.84% Class II was 39.88% (Class II div-1 was 32.74 % and Class II div 2 was 7.14 %), Class III patient was 14.28% who are attending Dhaka Dental College in the department of Orthodontics in the year of 1992 - 1994.

As our general health status indicators are not upto satisfaction & most of the populations are not concerned about oral health, hardly any information was available on the dental morbidity pattern of adolescents in Dhaka. We believed hospital is the best place to contact a large number of teenagers together. It was therefore decided to do a hospital based study among 12 to 18 year olds in the Orthodontic department in Dhaka Dental College & Hospital, Bangladesh. The aim was to find out the dental morbidity pattern of adolescents for planning community dental services. This age group was chosen because it is the time of adolescent growth spurt and orthodontic problems are most amenable for correction in this age group[12].The information's was gathered throws light on the current needs in dental care among attending adolescents.

Oral health is an essential component of health throughout life. However, millions of individuals suffer from dental caries and periodontal disease, resulting in unnecessary pain, difficulty in chewing, swallowing and speaking, and increased medical costs; hence, the present study was conducted to evaluate the oral health status of Orthodontic patient which would help us in planning and implementing necessary preventive measures[13]

MATERIALS & METHODS

Study design
Descriptive cross sectional study

Place of study
Department of Orthodontics & Dentofacial Orthopaedics of Dhaka Dental College & Hospital, Dhaka.

Sample selection
In this study, A total number of 500 patients (250 males & 250 females) were selected from Orthodontic department in Dhaka Dental College & Hospital.

Selection criteria

Inclusion criteria
- The participant and their parents were Bangladeshi in origin.
- They were between 12-18 years of age.
- They were free from any serious illness and have no history of trauma or surgery.

Exclusion criteria
- Non Co-operative Patient.
- Patient with systemic illness.
- History of previous Orthodontic treatment.

Study procedure
Each of the subjects was selected in respect of inclusion and exclusion criteria. A data collection sheet with necessary measurements for each subject was filled.

Measurements
Clinical Examination of Each Participant carried the following criteria-

Dental Caries
The teeth showing discoloration, chalky appearance of enamel, softened enamel or broken surface by visual examination or probing is defined as carious tooth[14].
The caries Index DMF[15] was developed by Klien, Polemar & Knutson. DMF =D indicates a decayed tooth, M indicates a missing tooth, F indicates a permanently filled tooth due to decay.

Method
All teeth except 3rd molars are examined. There are no scoring patterns. In the provided boxes the decayed, missing, filled tooth or surfaces are marked & finally the total counts are made.

Rules

DMFT
1. Primary caries of any surface of tooth comes under decay category.
2. Secondary caries under restoration comes under decay category.
3. Tooth with temporary restoration comes under decay category.
4. Tooth exfoliated or extracted due to decay comes under missing category.
5. Tooth missed due to periodontal diseases or extraction due to orthodontic purpose doesn't come under missing category.
6. Any tooth with permanent restoration due to dental caries comes under filling category.
7. Root canal treated tooth because of pulpal involvement due to caries comes under filling category.
8. Normal exfoliation during mixed dentition does not come under missing category.

DMFS
1. Here teeth surfaces are examined. The anterior teeth have 4 surfaces, and posterior teeth have 5 surfaces.
2. Rules of decay category are as same as that of DMFT.
3. When a tooth is completely missing due to caries, while counting the missing surfaces, one surface less is calculated.

4. Filling category rules are as same as that of DMFT.

Gingivitis
Bleeding from gum on visual examination or bleeding from sulcus on gentle probing & presence of deposits on teeth is diagnosed as gingivitis.[16]

The gingival index (GI) was developed by Loe and Silness[17] to describe the clinical severity and location of gingival inflammation using a mouth mirror and periodontal probe, the mesial, distal, buccal and lingual surface of six index teeth examined: maxillary right first molar, maxillary right lateral incisor, maxillary right first premolar, mandibular left first molar, mandibular left lateral incisor and mandibular right first premolar.

The scores were defined based on severity from 0-3.
0= Normal gingiva
1= Mild inflammation-light change in colour, slight edema but no bleeding on probing (BOP).
2= Moderate inflammation- redness, edema and glazing, and BOP.
3= Severe inflammation- marked redness and edema, ulceration and tendency to spontaneous bleeding.

The average score of each tooth was calculated by dividing the score of each tooth surface by the number of surfaces examined. The final numerical score per person obtained using the following formula:
Score per person = sum of individual tooth scores / number of teeth examined.

Retained deciduous teeth
Deciduous tooth is retained beyond the time of exfoliation is diagnosed as retained deciduous teeth.[18]

Fractured teeth
Teeth with broken edges with no obvious evidence of caries are diagnosed as traumatic fractured teeth. This is confirmed by eliciting history of trauma after diagnosing fractured teeth.[19]

Types[20]

• Infarction of enamel
• Fracture of enamel
• Fracture of enamel & dentine
• Fracture of enamel & dentine with pulp exposure
• Crown-root fracture involving enamel, dentine, cementum & pulp
• Intra-alveolar root fracture
• Concussion

- Sub luxation
- Extrusive luxation
- Lateral luxation
- Intrusive luxation
- Avulsion.

Orthodontic problems
Presence of all varieties of malocclusion due to any cause is diagnosed as orthodontic problem. Malocclusion is defined as any deviation from ideal occlusion.[21]
Malocclusions in this study were classified according to Angle classification.
Angle Class I malocclusion.
Angle Class II div1 malocclusion.
Angle Class II div2 malocclusion.
Angle Class III malocclusion.

Data collection and processing
Dental examination for 50 patients, were carried out per week. All the patients of the respective age groups were gathered and given introductory health talk. Methods of healthy tooth brushing, and general oral hygiene were taught to all. A small brochure on dental hygiene was given to all. The patients were examined by a single examiner for dental caries, gingivitis, retained deciduous teeth, fractured teeth and orthodontic problems to avoid inter examiner variations. After collection of data the obtained data was checked, verified & edited. These were entered in a personal computer using the SPSS (statistical package for social science) software. Entered data were cleaned, edited and appropriate statistical tests were done depending on the distribution of data.

DATA ANALYSIS

All data analyzed through standard statistical methods by using SPSS / STATA 10 software.

ETHICAL MEASURES

The purpose of this study was to know the prevalence & pattern of dental health problems among Bangladeshi people. Since this was a cross sectional study, there were no physical risk of the patients throughout the study period. All patients had a case number to maintain their confidentiality. All patients in the study signed a written informed consent form. No information has been withheld from the patient. No experimental drug or placebo was used.

RESULT

This was a cross sectional study conducted among 500 patients in the department of Orthodontics and Dentofacial Orthopaedics, Dhaka Dental College and Hospital.

250 male and 250 female made up the study population (graph 1).

Graph-1: Distribution the age and sex of surveyed population
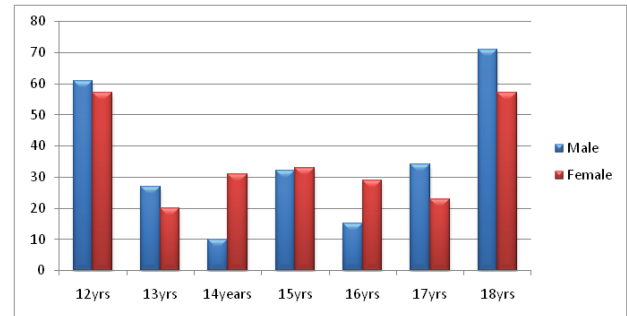

Table 1 & 2 and Graph 2 & 3 showed 42.4% had caries and caries rate slightly more in male (50.5%) than female(49.5%) but not clinically significant. Filling 8.6 % , more in female (69.8%) than male (30.2%), Gingivitis 48.4%, more in male (61.2%) than Female (38.8%), retained deciduous 6%, fractured teeth 16.8% , more in male (65.5%) than Female (34.5%), multiple problem 84.6% and others 0.06%. It was observed that the gingivitis was most prevalent condition. This was followed by dental caries, fractured teeth, restored teeth and retained deciduous teeth.

Table-1 Gender wise distribution of dental morbidities

Dental condition	Total no affected	%	Male	%	Female	%	P-value
Dental Caries	212	42.4	107	50.5	105	49.5	0.8271
Filling for Caries	43	8.6	13	30.2	30	69.8	0.0001*
Gingivitis	242	48.4	148	61.2	94	38.8	0.0001*
Retained deciduous teeth	30	6.0	15	50.0	15	50.0	NS
Fractured teeth	84	16.8	55	65.5	29	34.5	0.0001*
Multiple problems	423	84.6	225	53.2	198	46.8	0.1524
Other problems	32	0.06	17	53.1	15	46.9	0.1797

*P < 0.05 is statistically significant, NS- Not significant

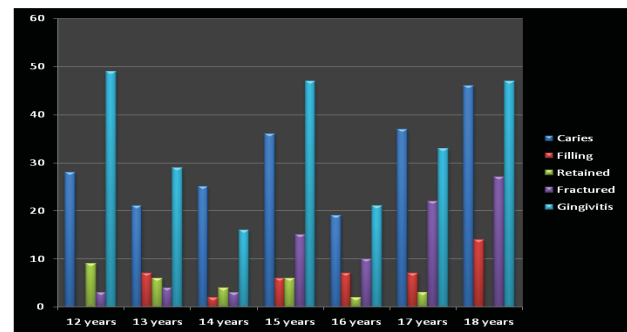**Graph-2 Age Wise distribution of different dental morbidities**

Table-2 Showing the Commonest Dental Morbidity Conditions

Disease Conditions	Total no. examined	No. Suffering from each condition	Proportion
Dental caries	500	212	42.4
Gingivitis	500	242	48.4
Filling for Caries	500	43	8.6
Fractured teeth	500	84	16.8

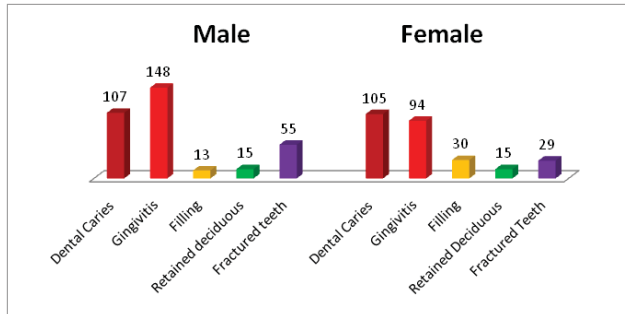**Graph-3 Gender wise distribution of different dental morbidities**

Table 3 and pie chart showed the prevalence of malocclusion (Orthodontic problem). Result showed Class I malocclusion was the most (61.8%) and Class I malocclusion was more in Male (54%) than female (46%). Class II div-1 was 23% and Class II div-1 malocclusion was more in Female (57.4%) than Male (42.6%). %). Class II div-2 was 2.2% and Class II div-2 malocclusion was more in Female (63.6%) than Male (36.4%). Class III was 13% and Class III malocclusion was more in Female (53.8%) than Male (46.2%).

Table-3 Type of Malocclusion

Angle's classification	Total	%	Male	%	Female	%	P-value
Class-1	309	61.8	167	54.0	142	46.0	0.0736
Class-II div 1	115	23.0	49	42.6	66	57.4	0.0009*
Class-II div 2	11	2.2	4	36.4	7	63.6	0.0001*
Class-III	65	13.0	30	46.2	35	53.8	0.0892

*P < 0.05 is statistically significant

Graph-4: Type of Malocclusion
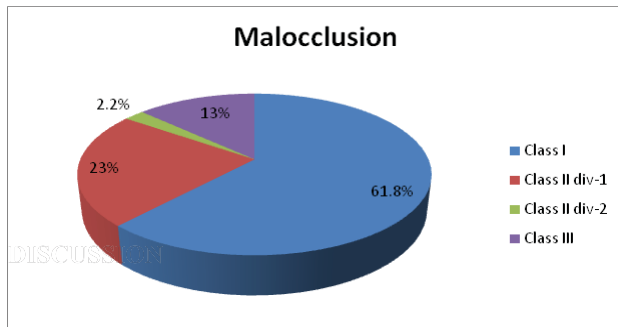
Gingivitis is the commonest dental problem encountered. The prevalence of gingivitis observed in this study was 48.4% and higher prevalence in males (61.2%) than in female (38.8%). This findings are in disagreement with Jose A[22] who found only 15% prevalence of gingivitis with higher prevalence in female (56%) than in male (44%). Sutcliff survey also shows high prevalence among females.[23]

The prevalence of dental caries observed in this study was 42.4%. Both males and females were almost equally affected by caries with slightly higher prevalence among males. A study conducted by Jose A and Joseph M R[22] in rural Kerala reports 54.3% prevalence of dental caries and both males and females were almost equally affected by caries with slightly higher prevalence among males. A study conducted by Sogi G[24] in Davangare using DMFT/DMFS score reports higher prevalence in females that is statistically significant. A Study conducted by Cand.Odont. Severre Aukland and Cand. Odont. Johny Bjelkaroey[25] reports 45.8% prevalence of dental caries. Findings of this present study are in agreement with Jose A and Johny Bjelkaroey.

The prevalence of fractured tooth observed in this study was 16.8%, and higher in male (65.5%) than in female (34.5%). Finn also reports higher incidence of fractured teeth among boys. This may well be explained by the more aggressive eating habits of the boys.[26] Also chances of fights and falls are commoner among them which also contribute to fractured teeth.[14]

Among 500 male and female subjects only 8.65 had dental filling and among of all those subjects more females (69.8%) have dental fillings than males (30.2%). Jose A[22] also reports 3.18% dental fillings and higher in males which disagreed with present study.

As age advances retained deciduous teeth become less but still 6% Subjects had retained deciduous teeth with both males and females were equally affected. Jose A found 7% retained deciduous teeth.[22]

Present study showed Class I malocclusion was the most (61.8%) and Class I malocclusion was more in Male (54%) than female (46%). Class II div-1 was 23% and Class II div-1 malocclusion was more in Female (57.4%) than Male (42.6%). %). Class II div-2 was 2.2% and Class II div-2 malocclusion was more in Female (63.6%) than Male (36.4%). Class III was 13% and Class III malocclusion was more in Female (53.8%) than Male (46.2%). According to Hossain MZ[4] Class I malocclusion was (55.22%), Class II div-1 was 28.85% and Class II div-2 was 3.48% and Class III

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was 8.48 %. According to Ahmed N5 Class I malocclusion was (45.84%), Class II div-1 was 32.74% and Class II div-2 was 7.14 % and Class III was 14.28 %.

Gingivitis is the commonest problem in Bangladesh according to present study. The second most dental problem was dental caries. The prevalence of orthodontic problems was comparable to the observations made by others. Males and females are equally affected with slight variations in the nature of problems among both genders.

Limitation of study

1. The study group was selected from Dhaka Dental College & Hospital. So the findings might be specific area, which may not represent the whole national situation.
2. The study was not done in a specific race of population.
3. The size of the sample of the study was limited in relation to the great number of populations in Bangladesh to represent the situation prevailing nationality.

CONCLUSION

Good oral health is essential to improve individual overall health & well-being. We urge to take this information & use it for program planning & advocating for the health of patients. It is only through working together that we can make excellent oral health a reality for these patients. Since the number of orthodontists available to treat patients in Bangladesh is limited, there is a high demand on each practitioner. Therefore current orthodontics students should receive more education & training in the management of malocclusion to improve the overall quality of care for patients.

RECOMMENDATION

As the size of the sample of this study is limited in relation to the great number of population in Bangladesh, so recommendation is put forward for future researcher to do additional depth research consisting of large sample group for greater acceptability of the study.

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