

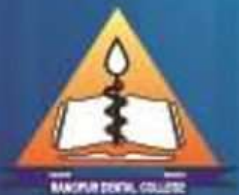
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Dental Caries Status among School Children in Rangpur, Bangladesh

Ahmad MS¹, Rashid MA², Mamun MA³, Alam M⁴

ABSTRACT:

Background: Maintenance of oral hygiene is important to restore the deciduous and permanent set of dentition. Dental caries is chronic progressive and not of a life threatening disease. Early detection of disease in most cases is crucial to save lives.

Objectives: To detect the dental health status of school children in order to prevent and control of dental caries at community level.

Methods: A comparative study carried out on 216 students of rural and urban High School at Rangpur, Bangladesh. A structured questionnaire considering all objectives of the study was used in data collection. Decayed, missing and filled teeth were recorded during the clinical examination. Materials used for oral examination were –dental caries probe, dental mirror, cotton, antiseptic solution. The students' dental examinations were carried out with torch light on normal chair. SPSS software package (version 17) was used to analyze the data. Descriptive statistics were used for all variables.

Results: In both rural and urban area, most of the students had no dental caries. In rural, 101(93.5%) students had all teeth and in urban 97(89.8%) students had all teeth. Among the urban, 11(10.2%) students missed one or more teeth while among the rural, only 7(6.5%) students missed one or more teeth. Among rural students, 10(9.3%) had filled teeth and 6(5.6%) had filled teeth among the urban students.

Conclusion: Dental caries is alarmingly high among the urban students irrespective of social class or educational status of the parents. School may play an important role by providing a health promoting environment and healthy lifestyles.

Key Words: Dental caries, DMFT, knowledge

Rangpur Dent. Coll J 2013; 1(2): 6-9

INTRODUCTION:

Oral Health status of both children and adult can be assessed by presence or absence of dental caries by DMFT (D=Decayed, M=Missing, F=Filled teeth) indexed by WHO¹. Maintenance of oral hygiene is important to restore the deciduous and permanent set of dentition. Dental decay commonly known as dental caries is common causes of tooth loss among children and adults all over the world.² Dental caries is chronic progressive and not of a life threatening disease. It is a common problem in both the developed and developing countries. The etiologies of dental caries are: i. cariogenic bacteria (Agent) ii. Susceptible tooth surface (host) iii. Diet (fermentable carbohydrate). However, the inter play between these factors has to take place in an appropriate time.³ Dental caries and periodontal diseases are both can be effectively prevented and controlled through a combination of community, professional and individual action.⁴ Early detection of diseases in most cases is crucial to saving life.

A thorough oral examination can detect nutritional deficiency and a number of general diseases including microbial infection, immune disorder, injury and oral cancer.

The aim of this study is to dental health status in school children in order to prevent and control dental diseases in community level.

METHODS:

A comparative study carried out in a rural and a urban High School at Rangpur, from April 2010 to June 2010. Two hundred and sixteen, (108 from rural and 108 from urban) students of class IX and X were selected as study sample. A structured questionnaire (both Bengali and English versions) considering all objectives of the study was used in data collection. Prior to commencement of this study the local committee approved the thesis protocol. Data were collected by the researcher himself through face-to-face

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interview of the students of class IX and X and by oral examination. Dental examination of the students and interview of them were done after taking verbal consent of the class teachers. All the students of class IX and class X included in this study were informed about the nature of the study and agreed to participate voluntarily in this study. Decayed, missing and filled teeth were recorded during the clinical examination. Materials used for oral examination were dental caries probe, dental mirror, cotton, antiseptic solution. The students' dental examinations were carried out with torch light on normal chair. Pointed end of the caries probe was gently pressed over the black marks if any on the tooth surface to identify carious teeth. Tip of the periodontal probe was introduced into the selected gingival margin to score the gingival condition. The data were checked before leaving the interview area and necessary correction were made at the spot. Statistical Analysis: SPSS software package (version 17) was used to analyze the data. Descriptive statistics were used for all variables. Values were expressed as percentage, multivariate analysis, chi-square test.

RESULTS:

Among the rural students 6(5.6%) were 13 years, 42(38.9%) were 14 years, 51(47.2%) were 15 years and 9(8.3%) were 16 years. Among the urban 108 students?

Table-I: Distribution of the secondary school students by age, sex and parents' education (n=216)

Age of the Students	Rural		Urban	
	n	%	n	%
13Yrs	6	5.6	3	2.8
14 Yrs	42	38.9	54	50.0
15 Yrs	51	47.2	44	40.7
16 Yrs	9	8.3	7	6.5
Total	108	100.0	108	100.0
Sex of the Students				
Male	34	31.5	59	54.6
Female	74	68.5	49	45.4
Total	108	100.0	108	100.0
Fathers' Education				
Illiterate	20	18.5	0	0
Primary	47	43.5	10	9.3
SSC	20	18.5	28	25.9
HSC	1	1.2	28	25.9
Higher	8	7.4	42	38.9
Total	108	100.0	108	100.0
Mothers' Education				
Illiterate	26	24.1	2	2.1
Primary	55	50.9	28	25.9
SSC	23	21.3	34	31.5
HSC	4	3.7	36	33.3
Higher	0	0	8	7.4
Total	108	100.0	108	100.0

3(2.8%) were 13 years, 54(50.0%) were 14 years, 44(40.7%) were 15 years and 7(6.5%) were 16 years.

According to sex, among the rural 108 students 34(31.5%) were male and 74(68.5%) were female; and among the urban 108 students 59(54.6%) were male and 49(45.4%) were female (table-I)

Among 42(38.9%) rural students, 25(59.5%) had fair knowledge about the causes of dental caries, 11(26.2%) had poor knowledge and only 6(14.3%) had good knowledge about the causes of dental caries. Among 72 (66.7%) urban students, 40 (55.56%) had fair knowledge about the causes of dental caries, 24(33.33%) had poor knowledge and only 8 (11.11%) had good knowledge about the causes of dental caries.

Table-II: Distribution of the students by knowledge related to dental caries (n=216)

Knowledge about Dental Caries	Rural		Urban	
	n	%	n	%
Yes	42	38.9	72	66.7
No	66	61.1	36	33.3
Total	108	100.0	108	100.0
Knowledge about Causes of Dental Caries				
Poor	11	26.2	24	33.33
Fair	25	59.5	40	55.56
Good	6	14.3	8	11.11
Total	42	100.0	72	100.0
Knowledge about Complications of Dental Caries				
Poor	16	38.1	32	44.44
Fair	24	57.1	36	50
Good	2	4.8	4	5.56
Total	42	100.0	72	100.0
Knowledge about Prevention of Dental Caries				
Yes	37	34.3	69	63.9
No	71	65.7	39	36.1
Total	108	100.0	108	100.0

Among 42 (38.9%) rural students, 24(57.1%) had fair knowledge about complications of dental caries, 16 (38.1%) had poor knowledge and only 2 (4.8%) had good knowledge about complications of dental caries. Among 72 (66.7%) urban students, 36(50%) had fair knowledge about complications of dental caries, 32 (44.44%) had poor knowledge and only 4 (5.56%) had good knowledge about complications of dental caries.

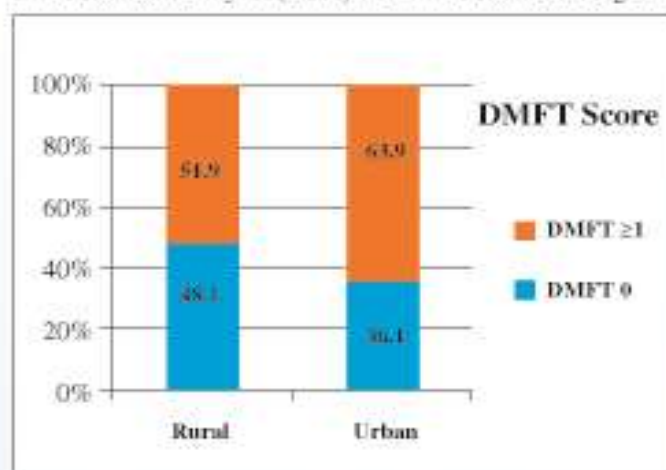
Among 108 rural students 71(65.7%) did not know about prevention of dental caries while 37(34.3%) knew about prevention of dental caries. Among 108 urban students 69(63.9%) knew about prevention of dental caries while

Table-III: Distribution of the students according to DMFT (n=216)

Presence of Dental Caries	Rural		Urban	
	n	%	n	%
Present	43	39.8	57	52.8
Absent	65	60.2	51	47.2
Total	108	100.0	108	100.0
Number of Dental Caries				
One	15	34.9	20	35.1
Two	13	30.2	18	31.6
Three	9	20.9	12	21.1
Four or more	6	14.0	7	12.3
Total	43	100.0	57	100.0
Presence of Missing Teeth				
Present	7	6.5	11	10.2
Absent	101	93.5	97	89.8
Total	108	100.0	108	100.0
Number of Missing Teeth				
One	4	57.1	9	81.8
Two	2	28.6	2	18.2
Three	1	14.3	0	0.0
Total	7	100.0	11	100.0
Presence of Filled Teeth				
Present	10	9.3	6	5.6
Absent	98	90.7	102	94.4
Total	108	100.0	108	100.0
Number of Filled Teeth				
One	3	30.0	4	66.7
Two	5	50.0	2	33.3
Three	2	20.0	0	0.0
Total	10	100.0	6	100.0

39(36.1%) did not know about prevention of dental caries (table-II).

Among 108 rural students, 98(90.7%) did not have any filled teeth and only 10(9.3%) had filled teeth. Among 108

**Figure-1.** Distribution of the students according to DMFT score

urban students, 102(94.4%) did not have any filled teeth and only 6(5.6%) had filled teeth (table-III).

Among 108 rural students, 56(51.9%) had DMFT score 1 or above and 52(48.1%) had DMFT score 0. Among the 108 urban students, 69(63.9%) had DMFT score 1 or above, while 39(36.1%) had DMFT score 0 (Figure-1).

DISCUSSION:

Among the 108 students, in rural 68.5% were females, while 31.5% were males, in urban 45.4% were females, while 54.6% were males. In this study 52.8% of urban student and 39.8 %of rural student had carious teeth present in their mouth, ranging from 1 to more than 4 carious teeth. This finding about the prevalence of dental caries children is quite similar to the findings by Sayegh et al.⁵ who reported 67% Jordanian children of the same age suffering from dental caries. Neemi et al.⁶ reported a similar high (74.1%) caries prevalence among Turkish school students. Mhejabeen et al.⁷ had also found very high prevalence of dental caries in Indian city of Dharwad. All these finding represent developing countries where as in a developed country like USA, according to the study by Brown⁸, only 20% of children suffered from dental caries and up to 60% do not have dental caries.

The present study found that 6.5% of rural and 10.2% of urban students having one or more teeth missing due to extraction. Filling was present in only 9.3% of rural and 5.6% of urban students. Findings of the present study is quite similar with the study conducted by Henkuzena et al.⁹ shows 31% of Latvian children having filled teeth which is higher than the present study and 9.5% of them having missing teeth is quite similar with the present study.

In this study an overall score of DMFT 0 was recorded in 48.1% of the rural and 36.1% of the urban students, while 51.9% of rural and 63.9% of urban students demonstrated DMFT score of 1 or higher which is similar with the study conducted by Neemi et al.⁶ in their study they found dmft score of 0 in 28% of the children, while 77(72%) children demonstrate dmft score of 1 or higher. A cross-sectional study was conducted by Kijakazi O Mashoto et al.¹⁰ in Kilwa district of Tanzania, in their study had found DMFT>01 of 20.2% which is much lower than the present study.

Parent's education level is an important factor for lower dental cares. Mohebbi et al.¹¹ Matilla et al.¹² and Chu et al.¹³ in their studies had found significant association between low dmft scores and parents educational and socio-demographic status.

In the present study only 38.9% of the rural and 66.7% of the urban students showed good, fair or poor knowledge when they were inquired about their knowledge regarding the cause, prevention and management of dental caries but this was not reflected in their DMFT status. This finding infers that even though students possess some theoretical

knowledge about dental diseases, this might not reflect their understanding of the importance of dental care and they need proper dental health education.

CONCLUSION:

Based on findings this study has revealed that the dental caries is alarmingly high among the urban students irrespective of social class or educational status of the parents. Schools may play an important role by providing a health promoting environment and healthy lifestyles. School curricula should include dental health education programmes related to dental caries prevention and healthy dietary habits designed according to the age and maturity level of the children.

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Oral Hygiene Practice by School Children in Narayanganj Region, Bangladesh

Xenith FA¹, Islam MS²

ABSTRACT:

Background: A healthy mouth enables people to eat, speak and socialize without pain, discomfort or embarrassment. The oral cavity is a portal of entry and the site for microbial infections that affect overall health status. Oral diseases are one of the most prevalent diseases, endangering our health and safety.

Objectives: The objective of this study was to identify oral hygiene practiced by school children in Narayanganj, Bangladesh.

Methods: A descriptive cross-sectional study carried out among 474 students of class I-X of at randomly selected schools in Narayanganj, Bangladesh. The samples were collected by purposive sampling technique and a structured questionnaire considering objectives of the study was used to collect data. Data were collected by face-to-face interview of the students. SPSS software (version 19) was used to analyze the data, and descriptive statistics and chi-square test were done.

Results: Maximum, [274(57.8%)] children brushed their teeth every day at age of 5 to 10 years, and 233 (49.2%) children brushed their teeth at morning and night. Relationship between age and oral hygiene practice is statistically significant (P value 0.05). Male and female are relatively same in oral hygiene practice. Most of [438(92.4%)] the children clean teeth with tooth brush and tooth paste, 243(51.3%) children used tooth brush in upward and downward direction.

Conclusion: Age, parents' education, teachers, others personnels and media are important factors to motivate the children to maintain oral hygiene regularly, properly and using teeth cleaning devices and materials.

Key Words: Oral hygiene practice, School children

Rangpur Dent Coll J 2013; 1(2): 10-14

INTRODUCTION:

Oral health is a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity¹. Risk factors for oral diseases include poor oral hygiene, unhealthy diet, tobacco and alcohol use. A healthy mouth enables people to eat, speak and socialize without pain, discomfort or embarrassment.² The oral cavity is a portal of entry and the site for microbial infections that affect overall health status.³ Oral diseases are one of the most prevalent diseases, endangering our health and safety.⁴ Neglecting oral hygiene can cause caries, toothache, and loss of teeth which could lead to disability of chewing, and speech; orthodontic problems and TMJ disorders⁵. Poor oral health might have a profound effect on general health. Bacteria from the oral cavity can be aspirated into the lung to cause respiratory diseases such as pneumonia, especially in people with periodontal disease. People with periodontal disease are almost twice as likely to suffer from coronary artery disease as those without periodontal disease⁶. There is association between human periodontal disease and

certain systemic disorders such as diabetes mellitus, pneumonia, heart disease and pre-term birth.⁶

Plaque largely is made up of commensal species in the mouth⁷. Dental plaque formations involve an ordered pattern of colonization by many different bacteria.⁸ The accumulation of plaque is considered a complex and multifactor process overall.^{7,9} The changes in the specific composition and quantity of plaque alter its potential to cause periodontal and dental problems. The most common procedure to remove dental plaque involves using a toothbrush and toothpaste.^{7,9} Although using a toothbrush significantly improves the level of adequacy of oral hygiene, there are many other contributing factors,¹¹⁻¹³ such as dental flossing and mouth rinsing etc.⁷

Children who have dental caries in their primary dentition are more likely to have dental caries in permanent dentition.^{14,15} Growing children need proper guidance for healthy growth, upkeep and hygiene of their teeth.^{16,17} Permanent teeth erupt during the school age years. Good dental hygiene and regular attention to dental caries are

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vital parts of health supervise during this period. Correct brushing techniques and the role of fermentable carbohydrates that play in production of dental caries should be taught or reinforced. The objective of this study was to identify oral hygiene practice patterns among schoolchildren.

METHODS:

A descriptive cross-sectional study was carried out among the students of randomly selected different schools at Narayanganj in Bangladesh. The study was conducted from January 2012 to June 2012 among 474 students of class I to class X. The samples were collected by purposive sampling technique. In order to collect the data a structured questionnaire and a checklist was prepared at the beginning of the study considering all objectives and variables of the study. Data were collected by the researcher through face-to-face interview of the students and by oral examination. SPSS software package (version 19) was used to analyze the data. Descriptive statistics were used for all variables. Values were expressed as percentage and chi-square test was done. According to the objectives and variables of the study the results were presented in the form of tables and graphs.

RESULTS:

Among children, maximum, [279(58.9%)] were 5 to 10 years; male (50.4%) and female (49.6%) were about same; and regarding parent's education level, 133(28.1%) were higher educated and 19(4%) were literate (Figure-1).

Maximum, [274(57.8%)] children brushed their teeth every day at age of 5 to 10 years (table-I). From 5 to 10 years age, 123(25.9%) children and above 10 years age, 112(23.6%) children brushed their teeth twice daily (table-II). Total 233 (49.2%) children brushed their teeth at morning and night. Among them, 119(25.1%) children from 5 to 10 year age and 112(23.6%) are above 10 year age (table-III). Total 207(43.7%) children brushed their teeth for 3 minutes. Among them 124(26.2%) children from 5 to 10 year age

and 78(16.5%) children are above 10 year age (table-IV). Relationship between age and oral hygiene practice is statistically significant; P value ≤ 0.05 .

Among the males, 232(48.9%) children brushed their teeth every day (table-V), 111(23.4%) children brushed their teeth twice daily (table- VI), 110(23.2%) children brushed their teeth at morning and night (table-VII), 101(21.3%) children brushed their teeth for 3minutes (table-VIII). Among the females, 230(48.5%) children

Table I: Distribution of children according to teeth brushing in relation to age (n=474)

Age	Teeth Brushing			P value
	Every day	Some Times	Total	
up to 5 yrs	n 23	0	23	0.01
	% 4.9	.0	4.9	
5 to 10 yrs	n 274	5	279	
	% 57.8	1.1	58.9	
above 10 yrs	n 165	7	172	
	% 34.8	1.5	36.3	
Total	n 462	12	474	
	% 97.5	2.5	100	

P value reached from χ^2 test

Table II: Distribution of children according to relationship between age and frequency of teeth brushing (n=474)

Age	How Many Time Brushing				P value
	Once	Twice	Thrice	Total	
Up to 5 Yrs	n 21	2	0	23	0.083
	% 4.4	.4	.0	4.9	
5 to 10 Yrs	n 140	123	16	279	
	% 29.5	25.9	3.4	58.9	
Above 10 Yrs	n 50	112	10	172	
	% 10.5	23.6	2.1	36.2	
Total	n 211	237	26	474	
	% 44.5	50	5.5	100	

P value reached from χ^2 test

Table III: Distribution of children according to relationship between age and teeth brushing (n=474)

Age	When Brushing						P value
	Before Break Fast	After Break Fast	Before Bed	After Every Meal	Morning and Night	Total	
up to 5 yrs	n 21	0	0	0	2	23	0.096
	% 4.4	.0	.0	.0	.4	4.9	
5 to 10 yrs	n 142	2	2	14	119	279	
	% 30.0	.4	.4	3.0	25.1	58.9	
above 10 yrs	n 49	1	0	10	112	172	
	% 10.3	.2	.0	2.1	23.6	36.3	
Total	n 212	3	2	24	233	474	
	% 44.7	.6	.4	5.1	49.2	100	

P value reached from χ^2 test

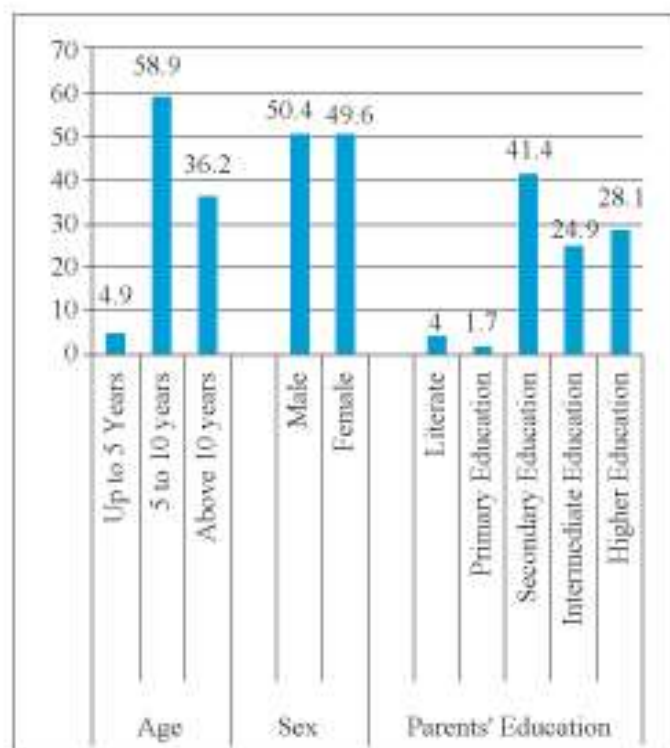


Figure-1: Socio-demographic status of the Children

Table IV: Distribution of children according to relationship between age and duration of teeth brushing (n=474)

Age	Brushing Duration			Total	P value
	1to2 min	3 min	>3 min		
Up to 5 Yrs	n	14	5	4	23
	%	3	1.1	8	4.9
5 to 10 Yrs	n	95	124	60	279
	%	20	26.2	12.7	58.9
Above 10 Yrs	n	34	78	60	172
	%	7.2	16.5	12.7	36.3
Total	n	143	207	124	474
	%	30.2	43.7	26.2	100

P value reached from χ^2 test

Table VII: Distribution of children according to relationship between sex and time of teeth brushing (n=474)

Age	When Brushing						P value
	Before Break Fast	After Break Fast	Before Bed	After Every Meal	Morning and Night	Total	
Male	n	113	1	2	13	110	239
	%	23.8	.2	.4	2.7	23.2	50.4
Female	n	99	2	0	11	123	235
	%	20.9	0.4	0	2.3	25.9	49.6
Total	n	212	3	2	24	233	474
	%	44.7	.6	.4	5.1	49.2	100

P value reached from χ^2 test

Table V: Distribution of children according to relationship between sex and teeth brushing (n=474)

Sex	Teeth Brushing		Total	P value
	Every day	Some Times		
Male	n	232	7	239
	%	48.9	1.5	50.4
Female	n	230	5	235
	%	48.5	1.1	49.6
Total	n	462	12	474
	%	97.5	2.5	100

P value reached from χ^2 test

Table VI: Distribution of children according to relationship between sex and frequency of teeth brushing (n=474)

Sex	Brushing Frequency				P value
	Once	Twice	Thrice	Total	
Male	n	113	111	15	239
	%	23.8	23.4	3.2	50.4
Female	n	98	126	11	235
	%	20.7	26.6	2.3	49.6
Total	n	211	237	26	474
	%	44.5	50	5.5	100

P value reached from χ^2 test

Table VIII: Distribution of children according to relationship between sex and duration of teeth brushing (n=474)

Sex	Teeth Brushing				P value	
	1 to 2 min	3 min	>3 min	Total		
Male	n	76	101	62	239	0.01
	%	16	21.3	13.1	50.4	
Female	n	67	106	62	235	
	%	14.1	22.4	13.1	49.6	
Total	n	143	207	124	474	
	%	30.2	43.7	26.2	100	

P value reached from χ^2 test

brushed their teeth every day (table-V), 126(26.6%) children brushed their teeth twice daily (table-VI), 123(25.9%) children brushed their teeth at morning and night (table-VII) and 106(22.4%) children brushed their teeth for 3minutes (table-VIII). Relationship between sex and oral hygiene practice is statistically significant; P value 0.05. Among the children, 438(92.4%) children clean their teeth with tooth brush, 417(92.4%) used tooth pest during teeth brushing; 186(39.2%) used tooth brush in forward and backward direction, 243(51.3%) used tooth brush in upward and downward direction.

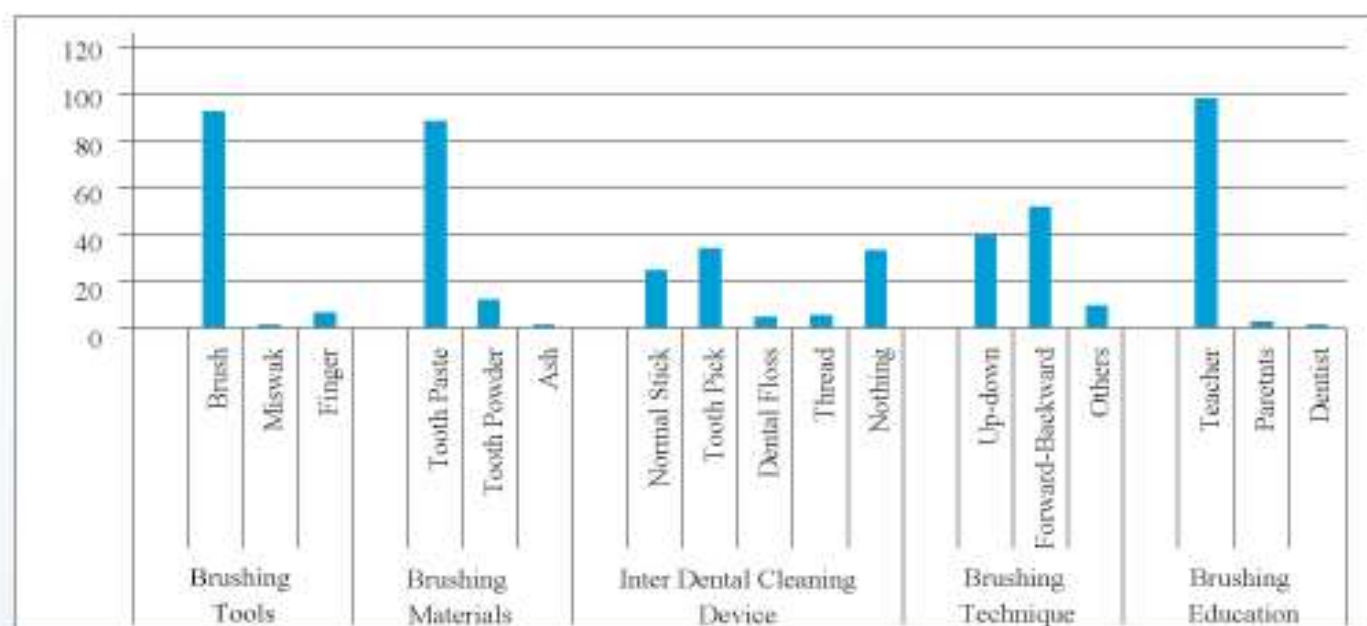
Among the children, 115(24.3%) used normal stick, 160(33.8%) used tooth pick, 19(4%) used thread, 23(4.9%) used dental floss for inter dental cleaning. Among the children, 462(97.5%) are taught tooth brushing from their parents, 10(2.1%) are taught tooth brushing from their teacher and 2(0.4%) are taught tooth brushing from their dentist (figure-2).

DISCUSSION:

By socio-demographic status, maximum (58.9%) childrens were 5 to 10 years old, among them male and female were same; and education level of maximum, (41.4%) children's parents were secondary and literate were minimum (4%). A study¹⁸, conducted on Bangladeshi primary school children, 51.98% children were male and 47.97% were children female; and age of the childrens was from 6 to 13 years. Another study¹⁹ was conducted on Bangladeshi school going rural children, total 350 childrens were included in the study age ranging from 10 to 15 years, among them 45.71% were male and 54.29% were female. These study result is similar to the present study.

In this study it is found that most of the children brushed their teeth every day and twice daily at age of 5 to 10 years, and above 10 years age, maximum children brushed their teeth at morning and night for 3 minutes. Age is an important factor for maintaining oral hygiene, as increasing the age children can realize the importances of care of teeth. Khan²⁰ conducted a study on 3-12 years old 646 children in Swat, Pakistan and found border line significant in relationship of age and oral hygiene maintainence.

This study found no significant differences between male and female in regularity, frequency, time and duration of tooth brushing. Similar result are found in another study by Tak²¹ and Juan⁷. Mia et al¹⁸ found male children are significantly higher in regularity, frequency, time and duration of tooth brushing. These variation may be due to geographical variation as they collected sample from shariatpur district. There are socio-economic and environmental variation between two districts. The differences may be also due to technique of sample collection as they selected the school by two-stage cluster sampling design.

**Figure 1:** Distribution of children according to uses of oral hygiene aids

The present study found 92.4% children clean their teeth with tooth brush and tooth paste. This result is supported by Mia et al¹⁹ who found most of the respondents use tooth brush and pest to clean their teeth.

The results differ from another study by Sarwar et al²² who found that 33.2% were using tooth brush and 12% were using tooth paste; and rest of the respondents clean teeth using finger, branch of teeth, and ash, tooth powder and charcoal. These differences between due to as they conducted the study in rural area. Maximum (51.3%) children used tooth brush in upward-downward direction and rest of the children brush teeth in faulty direction. Most (97.5%) of the children are taught tooth brushing from their parents and rest of the respondents taught tooth brushing from others. Similar result found in the study by Mia et al¹⁹. Parents, teachers and others personnels and media are important factors to motivate the children to maintain oral hygiene.

CONCLUSION:

Age is an important factor for maintaining oral hygiene; as increasing the age children can realize the importances of of care of teeth and they emphasize on oral hygiene maintainence. Sex has no significances on oral hygiene practice. Most of the children clean their teeth with tooth brush and tooth pest. Use of finger, branch of tree, ash, tooth powder and charcoal are less amount. Parents, teachers and others personnels and media are important factors to motivate the children to maintain oral hygiene.

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Orthodontic Treatment of Class I Crowding in an Adult Male: A Case Report

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ABSTRACT:

This is a case report of a 21 years old male patient with maxillary and mandibular crowding and lock bite on upper right and left lateral incisors. The patient was treated by extracting all first premolars and followed by fixed orthodontic therapy.

Key Words: Class I malocclusion, crowding, edgewise orthodontic therapy.

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INTRODUCTION:

Crowding of the teeth is the most common type of malocclusion at present. Undoubtedly it is related in part to the continuing reduction in jaw and tooth size in human evolutionary development. Jaw dimensions do seem to have a strong genetic control. Environmental factors must have played some role in the recent increase in crowding of the dental arches.¹ Crowding and local irregularities are common causes of Class I malocclusion.² Primarily, three basic treatment strategies can be used to solve crowding: extraction, interproximal reduction, and expansion.³ Treatment approach for tooth-arch length discrepancies by extraction of permanent teeth reduces total tooth mass and allows the relationship between the dentition and the skeletal bases.^{4,5}

The aim and objectives of the treatment are to eliminate the crowding present in the upper and lower arch, correct the cross bite, establish and maintain a Class I molar and canine relationship, correct the mandibular dental midline discrepancy, establish normal over jet and overbite, and

establish and maintain occlusal harmony and interdigitation for improved aesthetics and proper function.

CASE REPORT:

A 21 year old male came to the department of Orthodontics and Dentofacial Orthopedics, Dhaka Dental College and Hospital with the chief complaint of upper and lower crowding with lock bite on upper right and left lateral incisors. He had no relevant dental, medical or family history and had no history of previous orthodontic treatment. On extraoral examination we found that he had a symmetric face with a straight profile. Lips are competent. His TMJ was alright and had a normal path of closure [Fig: 1]. Intraoral examination showed that crowding was present in the anterior region of both upper and lower arch. In occlusion he had 1 mm over jet and 1 mm overbite and upper right and left lateral incisors were in crossbite. There was Class I molar and canine relation, except left canine



Fig 1: Extra oral photograph (before treatment)

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which was Class II. His mandibular midline was shifted 3 mm to the left. There was no premature contact or any other pathology [Fig: 2]. On model analysis, the arch length deficiencies were (-6.5 mm) in the maxillary arch and (-7.5 mm) in the mandibular arch. Panoramic radiographs revealed that all the permanent teeth were present [Fig: 3A]. Cephalometric evaluation showed that he had a skeletal Class I relationship [Fig: 4A].

TREATMENT PLAN & PROGRESS:

As the arch length discrepancies were large in both the jaws, all 1st premolars were extracted and treatment started with fixed appliance.

In the upper arch, initial leveling was done with the use of 0.014 inch multiloop archwires over 3 months.

Then upper canines are retracted by using segments of elastomeric chain with 0.016 inch stainless steel arch wires. After closing the extraction space, 0.014 inch stainless steel with 'L' loops was placed to correct the cross bite of upper lateral incisors. In this stage bite opened by using posterior bite plane to free the lock.

In the lower arch, our approach was by sectional arch wire. As the lower canines were out of the arch, first canine retraction was done by sectional arch wire. Then leveling and alignment was done by 0.014 multiloop arch wires. The remaining extraction space on both arches was closed by using 0.016x 0.022 inch rectangular arch wires with tear



Fig 2: Intraoral photograph (before treatment)



Fig 3: Panoramic Radiograph before (A) and after treatment (B)



Fig 4: Cephalogram before (A) and after treatment (B)



Fig 5 Extraoral photograph after treatment



Fig 6: Intraoral photograph after treatment

drop contraction loops. After satisfactory interdigitation was achieved, the fixed appliances were removed. Then maxillary and mandibular removable retainers were placed. The active orthodontic treatment time was 18 months.

RESULTS:

The overall orthodontic treatment of this patient was quite successful. A Class I molar and canine relationship were established. The overjet and the overbite were corrected, and maxillary and mandibular crowding was eliminated. The final cephalometric radiograph is shown in figure-4. The posterior intercuspation was excellent with occlusal settlement and panoramic radiograph showed near parallel root position. The upper and lower incisors showed excellent inter arch relationship. The mandibular dental midline was improved. The dentition and the periodontal tissues remained healthy. Except moderate gingival recession over upper left canine, this was present before treatment. The profile was well balanced. It takes about 18 months from the starting of treatment.

DISCUSSION:

Crowding is common manifestation of a class I malocclusion. Various treatment modalities have been proposed for the correction of crowding. Crowding can be corrected either by expansion or extraction or proximal slicing.⁷ Extraction is usually done to relieve dental

crowding in severe arch length discrepancy. Whenever extraction are planned in a class I skeletal or dental pattern, it is virtually important that extractions are done in both the upper and lower arches so as to maintain the buccalocclusal relationship. Faruk AB and Serdar U⁸ concluded after study on 87 patients that the out come of extraction and non-extraction treatments are the same facial profiles of patients with Class I or Class II malocclusions. Aksu M and Kocadereli I⁹ stated that extraction treatment for class I cases increases intercanine arch width and maxillary intermolar width does not show any significance difference whereas the mandibular intermolar width decreases significantly.

In case of severe crowding, anchorage control becomes very important. Maintenance of anchorage while creating space for incisor alignment is necessary in order to meet the treatment objectives.

CONCLUSION:

Analysis of final records indicated that all treatment objectives were achieved. A satisfactory esthetic result had been achieved. The parent & patients psychological satisfaction was also achieved.

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Recurrent Suicidal Attempt by Amitriptyline Ingestion: A Case Report

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ABSTRACT:

Tricyclic antidepressant overdose is a significant cause of fatal drug poisoning. Because it has a narrow therapeutic index, the therapeutic dose is close to the toxic dose. Here we present a case report of recurrent amitriptyline poisoning by a young lady within one year. First episode was on 20th February, 2011 and second episode on 19th February, 2012. In both the episodes she took tablets tryptin (amitriptyline) in excess amount, started to vomit, became unconscious, was taken to hospital where she received supportive treatment and recovered completely.

Key Words: Amitriptyline, Fatal, Overdose.

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INTRODUCTION:

Acute poisoning is common, accounting for about 10% of hospital admissions in the UK. In developed countries, the most frequent cause is intentional drug overdose in the context of self-harm and usually involves prescribed or 'over the counter' medicines¹. Tricyclic antidepressants are the drugs that commonly used as antidepressants and to treat bed wetting in children². Overdose is caused by excessive use or overdose of a tricyclic antidepressant drug³. Tricyclic antidepressant includes amitriptyline, amoxapine, clomipramine, dothiepin, doxepin, imipramine, lofepramine, nortriptyline, protriptyline and trimipramine⁴. Among them amitriptyline and doxepin overdose carry the highest mortality and morbidity⁵. It is a significant cause of fatal drug poisoning. The severe morbidity and mortality associated with these drugs is well documented due to their cardiovascular and neurological toxicity. Additionally, it is a serious problem in the paediatric population due to their potential toxicity³. Studies in the 1990s in Australia and the United Kingdom showed that between 8 and 12% of drug overdoses were following TCA ingestion. TCAs may be involved in up to 33% of all fatal poisonings, second only to analgesics^{6,7}. Although the individual TCAs have differences in side-effects and kinetics, most behave similarly in an acute overdose. Peak plasma levels normally occur within 2-8 hours of a therapeutic dose because of delayed gastric emptying. After an overdose, peak levels may occur even later. Life-threatening signs may develop within 6 hours of ingestion or not at all. The complications most often associated with a fatal outcome are severe hypotension and cardiac arrhythmias⁴.

CASE REPORT:

First episode: Monty 19 years, student of honors class, living in a hostel, ingested tablet tryptin (10mg) (amitriptyline) 40 (forty) in number after argument with her husband. After ingestion she started vomiting and complained of abdominal and chest discomfort, gradually she became drowsy and restless. Her roommates noticed this and took her to the emergency department of Rangpur Medical College Hospital. There she was given stomach wash and got admitted in Medicine ward. On admission she was restless, drowsy, her blood pressure was 100/70 mm of Hg, pulse 120 beats/minute and regular, respiratory rate 35/minute, pupil-mid dilated reacting to light, crepitation was present on both lungs, GCS 10/15 and plantar reflex was normal. Initial ECG record was normal and subsequent follow up did not reveal any cardiac abnormality. Others investigations reports- total blood count, blood sugar, s.creatinine, s. electrolytes was normal. Supportive treatment was given with oxygen inhalation, normal saline infusion, continued catheterization, antibiotic, omeprazole, tab. ultra carbon was given through nasogastric tube. After that her condition gradually deteriorated.

Supportive treatment was continued and she gradually improved over a period of 5 days. Response of the patient with time: 1). Admission day- gradual deterioration, GCS 10/15 2). On 2nd day- deterioration continuing, GCS 6/15 with incomprehensible sound 3). On 3rd day - gradual improvement, her consciousness partially regained, GCS 10/15. 4). On 4th day- improvement continuing, GCS was 15/15. 5). On 5th day- she was completely cured.

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She was discharged after 7 days. During the hospital stay there was no episode of cardiac arrhythmia and convulsion. We follow up the patient for 3 months and there was no features or complications related to amitriptyline poisoning. She attended "1st National Conference on Poisoning and Snake bite, Rangpur" on 28th March, 2011 and said about the bad experiences and advised all not to do self-harm that she attempted.

Second episode: Monti 20 years, student of honors class, presented with the history of ingestion of tablet amitriptyline (10 mg) 50 in number. Her husband stated



Photo : Monti during first episode

This is the comparison of her status at admission and after one hour of admission

Parameter at admission	Parameter after 1 hour of admission
1. GCS- 10/15	1. GCS- 4/15
2. Pulse-120bpm	2. Pulse-150bpm
3. Blood pressure-100/70mm Hg	3. Blood pressure 90/60mm Hg
4. Pupil- mid dilated and reacting to light.	4. Pupil-dilated and reacting to light
5. Respiratory rate- 35/minute	5. Respiratory rate-40/minute
6. Planters response - bilateral flexor	6. Planter response- bilateral extensor

that she quarrelled with him last night over telephone and told him to meet with her. But before the meeting time Monti went to her husband and doing abnormal behaviour. Her husband suspected that she did something wrong and searched her hand bag and found blank strip of 50 amitriptyline tablets. Then she was taken to the emergency department of Rangpur Medical College Hospital where stomach wash was given. With the stomach wash fluid unabsorbed tablets came out. Then she was admitted in indoor of department of Medicine. At admission she was unconscious (GCS 5/15), pulse 115/min, blood pressure 130/80, pupil mid dilated, lungs-clear. Her attendance gave history of generalized convulsion two times after admission. ECG reveals atrial fibrillation, total blood count, blood sugar, s.creatinine, s. electrolytes was normal. Supportive treatment was given with oxygen inhalation, normal saline infusion, continued catheterization, antibiotic, omeprazole, tab. ultra carbon was given through nasogastric tube. Convulsion was controlled with injection diazepam and no treatment was given for atrial fibrillation. She recovered completely after 6 days. After recovery she was assessed by a Psychiatrist and diagnosed as a case of personality disorder.

DISCUSSION:

Tricyclic antidepressants (TCAs) are heterocyclic chemical compounds used primarily as antidepressants. The TCAs were first discovered in the early 1950s and were subsequently introduced later in the decade⁸. The TCAs are used primarily in the clinical treatment of mood disorders such as major depressive disorder (MDD), dysthymia, and treatment-resistant variants. They are also used in the treatment of a number of other medical disorders, including anxiety disorders such as generalized anxiety disorder (GAD), social phobia (SP) also known as social anxiety disorder (SAD), obsessive-compulsive disorder (OCD), and panic disorder (PD), post-traumatic stress disorder (PTSD), body dysmorphic disorder (BDD), eating disorders like anorexia nervosa and bulimia nervosa, certain personality disorders such as borderline personality disorder (BPD), attention-deficit hyperactivity disorder (ADHD), as well as chronic pain, neuralgia or neuropathic pain, and fibromyalgia, headache, or migraine, smoking cessation, irritable bowel syndrome (IBS), interstitial cystitis (IC), nocturnal enuresis (NE), narcolepsy, insomnia, chronic hiccups, and as an adjunct in schizophrenia⁹.

Many side effects may be related to the antimuscarinic properties of the TCAs. Such side effects are relatively common and may include dry mouth, dry nose, blurry vision, lowered gastrointestinal motility or constipation, urinary retention, cognitive and/or memory impairment, and increased body temperature. Other side-effects may include drowsiness, anxiety, emotional blunting (apathy/anhedonia), confusion, restlessness, dizziness, akathisia, hypersensitivity, changes in appetite and weight

gain, sweating, sexual dysfunction, muscle twitching, weakness, nausea and vomiting, hypotension, tachycardia, and rarely, irregular heart rhythms. Twitching, hallucinations, delirium and coma are also some of the toxic effects caused by overdose.¹⁰

TCA overdose is defined as suspected deliberate or accidental ingestion of TCA at above the recommended therapeutic dose. In the medical literature the lowest reported toxic dose is 6.7 mg per kg body weight. Although there are differences in toxicity with the drug class, ingestions of 10 to 20 mg per kilogram of body weight are a risk for moderate to severe poisoning, however, doses ranging from 1.5 to 5 mg/kg may even present a risk.¹¹ An overdose on TCA is especially fatal as they are rapidly absorbed from GI tract in the alkaline conditions of the small intestines. As a result, toxicity often becomes apparent in the first hour after an overdose. However, symptoms may take several hours to appear if a mixed overdose has caused delayed gastric emptying. Clinical features of TCA overdose are variable and widespread. Symptoms due to anticholinergic effects are altered mental status (e.g., agitation, confusion, lethargy, etc.), resting sinus tachycardia, dry mouth, mydriasis (pupil dilation), and raised temperature. Hypertension (early and transient), tachycardia, hypotension, arrhythmias (including ventricular tachycardia and ventricular fibrillation) are common cardiac complications. CNS effects include syncope, seizure, coma, myoclonus, hyperreflexia. Pulmonary effects are hypoventilation resulting from CNS depression, decreased or absent bowel sounds resulting in constipation due to toxic effect of TCA on GI tract¹². Factors that increase the risk of toxicity include advancing age, cardiac status, and concomitant use of other drugs¹³.

Measurements of plasma tricyclic concentrations are not widely available and measured levels often lack sensitivity in detecting active metabolites¹⁴. Petit et al demonstrated an increased incidence of seizures, coma and cardiac arrest in patients with a total tricyclic level greater than 1000 µg/l but subsequently it has been shown that prolongation of the QRS duration (>0.16 seconds) is a better predictor of seizures or ventricular arrhythmias than the plasma drug concentration¹⁵. Decreased R-R variations have been described as a method of identifying tricyclic overdose¹⁶. It has been suggested that a terminal R wave greater than 3mm in lead aVR is a more useful predictor of seizures or arrhythmias than QRS duration. The most frequent acid base disturbance is acidosis¹⁷. This is often a mixed acidosis with both respiratory depression and myocardial impairment/hypotension resulting in reduced tissue perfusion and the production of lactate. Hypokalaemia may be present and in a series of 295 patients 9% had a potassium concentration less than 3.0 mmol/l.¹⁸ However, serum drug levels are not useful for evaluating risk of arrhythmia or seizure in tricyclic overdose.¹⁹

An ECG should be recorded at presentation following TCA overdose. The ECG should be used to risk stratify patients with TCA overdose and to guide subsequent therapy. Serial ECG recordings should be examined for the presence of QRS prolongation (>100ms), QTc prolongation (>430ms) and R/S ratio >0.7 in lead aVR. These changes identify patients at high risk of developing complications following TCA overdose. Following TCA overdose asymptomatic, stable patients with no significant ECG abnormalities six hours after ingestion may be safely discharged.²⁰ Initial treatment of an acute overdose includes gastric decontamination of the patient. This is achieved by administering activated charcoal which absorbs the drug in the gastrointestinal tract either orally or via a nasogastric tube. Activated charcoal is most useful if given within 1 to 2 hours of ingestion.²¹ The consensus statement of European toxicologists that gastric lavage should only be performed within one hour of the ingestion of a potentially life threatening dose.²² Other decontamination methods such as induced emesis, or whole bowel irrigation are not recommended in TCA poisoning.^{23,24} Symptomatic patients are usually monitored in an intensive care unit for a minimum of 12 hours, with close attention paid to maintenance of the airways, along with monitoring of blood pressure, arterial pH, and continuous ECG monitoring.²⁵ Supportive therapy is given if necessary, including respiratory assistance, maintenance of body temperature, and administration of intravenous sodium bicarbonate as an antidote, which has been shown to be an effective treatment for resolving the metabolic acidosis and cardiovascular complications of TCA poisoning. If sodium bicarbonate therapy fails to improve cardiac symptoms, conventional antidysrhythmic drugs such as phenytoin and magnesium can be used to reverse any cardiac abnormalities. Hypotension is initially treated with fluids along with bicarbonate to reverse metabolic acidosis (if present), if the patient remains hypotensive despite fluids then further measures such as the administration of epinephrine, norepinephrine, or dopamine can be used to increase blood pressure.²⁶ Another potentially severe symptom is seizures. Seizures often resolve without treatment but administration of a benzodiazepine or other anticonvulsant may be required for persistent muscular over activity. There is no role for physostigmine in the treatment of tricyclic toxicity as it may increase cardiac toxicity and cause seizures.²⁷ Tricyclic antidepressants are highly protein bound and have a large volume of distribution; therefore removal of these compounds from the blood with hemodialysis, hemoperfusion or other techniques are unlikely to be of any significant benefit.²⁸

During both the episodes she bought the drugs from medicine shop without any prescription from registered physician. Amitriptyline is not an over the counter (OTC) drug, so its sell without prescription is against law. In this case report it is evident that availability of the drugs without prescription is one of the main reasons of overdose.

CONCLUSION:

This case report showed that TCA (amitriptyline) overdose should be managed with supportive treatment if there is no cardiac and neurological manifestations. Restriction of the availability of the amitriptyline as well as other sedatives will reduce the incidence of drug overdose.

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