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BANGLADESH DENTAL JOURNAL

Vol. 28

No. 1-2

2012



Official Journal of
The Bangladesh Dental Society

BANGLADESH DENTAL JOURNAL

Vol. 28, No. 1-2, 2012

The Official Journal of Bangladesh Dental Society
8/2, Paribagh, 3rd Floor, Motaleb Tower, Hatirpool, Dhaka-1205

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Subscription: Non members Tk. 100.00 for local and US\$ 20 for overseas subscriber. Members free.

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Editorial



There is a proverb in the health science that “mouth is the gateway of health”. Good oral health is the most important part of human health. The incidence of oro-dental disease has become very common in our country. Teeth play very important role in eating, speaking and esthetics of individual. Unfortunately, the growth of dental health care in our country is surprisingly neglected. Our people are not usually well conscious about their oro-dental health care.

Bangladesh dental journal is a mirror of dentistry including its special branches. It reflects the current advancement in treatment and research in dentistry. We believe that this journal will play an important role for education and communication for all levels dental surgeons in Bangladesh.

We have tried to include all the disciplines of dentistry so that the specialized of those subjects can enrich their knowledge. We always tried to ensure the quality of each article. An expert panel of reviewers was involved to standardize the quality of articles.

In addition, I would like to mention that the previous committee during the period of 2012-2015 did not publish any issues of Bangladesh dental journal. Newly elected executive of Bangladesh Dental Society has been formed this (current) new editorial board. It was very hard for us to publish the four volume of previous issues. But we tried hard and became successful to publish these issue.

This issue has original articles 10, case report 01 and review articles 03 of different fields of dentistry.

I am grateful to the panel of reviewers, all the executive members of Bangladesh Dental Society and my colleges who gave me guidance and idea in editing and publishing the journal successfully.

Dr. Md. Humayun Kabir
Editor-in-Chief
Bangladesh Dental Journal

Comparative study of single and double-gloving safety during arch bar placement for intermaxillary fixation

Amin MR¹, Moula SM², Talukder MA³, Sarwar MG⁴, Khondker MMH⁵

Abstract.

This prospective study was conducted to comparatively evaluate, for providing single and double gloving safety during arch bar placement for intermaxillary fixation. A total of 62 consecutive patients in whom application of an Erich arch bar was indicated for intermaxillary fixation were equally divided into two groups. In group 1. Single surgical gloves were used; in group 2. Double surgical gloves were used. Wilcoxon's, Mann-Whitney test and binomial statistical test were used to analyze the findings. A total of 152 perforations were found, in the group 1. 96 and group 2. total of 50 outer perforations and along with 6 inner gloves perforation were found. The nondominant hand presented with 71% of the perforations in single glove technique and double gloves technique's 68%. Double gloving techniques were found to provide effective clinicians protection than single gloving techniques. The single gloving techniques are less cost effective but did not maintain standardized cross-infection preventive measures.

Keywords: arch bar, intermaxillary fixation, gloving method

(Bangladesh Dental Journal 2012; 28: 1-4)

Introduction:

According to World Health Organization rationale for using medical gloves: Medical gloves are recommended to be worn for two main reasons: 1. To reduce the risk of contamination of health-care workers hands with blood and other body fluids. 2. To reduce the risk of germ dissemination to the environment and of transmission from the health-care worker to the patient and vice versa, as well as from one patient to another. Gloves should therefore be used during all patient-care activities that may involve exposure to blood and all other body fluid (including contact with mucous membrane and non-intact skin), during contact precautions and outbreak situations. The efficacy of gloves in preventing contamination of health-

care workers' hands and helping to reduce transmission of pathogens in health care has been confirmed in several clinical studies. Nevertheless, health-care workers should be informed that gloves do not provide complete protection against hand contamination. Pathogens may gain access to the caregivers' hands via small defects in gloves or by contamination of the hands during glove removal. Hand hygiene by rubbing or washing remains the basic to guarantee hand decontamination after glove removal. Preventive measures for the protection for patients, staff and doctor to reduce cross infection rate. Glove perforations may occur during surgical procedures, even though they often are not noticed during the procedure¹. This is achieved by using a protective barrier, such as gloves, to prevent skin contact with blood, secretion and mucosa². Gloves practices aim to avoid direct contact maxillofacial surgeon personnel with organic material. Glove perforations rate is directly related to the duration of procedure performed³, and the quality of the glove used⁴. The invasive nature of surgery, with its increased exposure to blood, means that during surgery there is a high risk of transfer of pathogens. Pathogens can be transferred through contact between surgical patients and the surgical team, resulting in post-operative or blood borne infections in patients or blood borne infections in the surgical team. Both patients and the surgical team need to be protected from this risk. This risk can be reduced by implementing protective barriers such

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as wearing surgical gloves. Wearing two pairs of surgical gloves, as opposed to one pair, is considered to provide an additional barrier and further reduce the risk of contamination.

The primary objective of this review was to determine if double gloving (wearing two pairs of gloves), rather than single gloving, reduces the number of post-operative or blood borne infections in surgical patients or blood borne infections in the surgical team. The secondary objective of this review was to determine if double gloving, rather than single gloving, reduces the number of perforations to the innermost pair of surgical gloves. The innermost gloves (next to skin) compared with the outermost gloves are considered to be the last barrier between the patient and the surgical team.

In Bangladesh among Oral & Maxillofacial Surgeon intermaxillary fixation has performed by frequently use single glove. Erich arch bar is common practice, carries a significant risk of perforation due to the rough edges of the bars and the stainless steel wires used for placement. However no qualitative or quantitative difference in postoperative infection rate when wearing sterile gloves or wearing nonsterile gloves during oral surgery has been found⁵. We performed here a comparative and randomized analysis of single and double-gloving protection during arch bar placement for intermaxillary fixation with Erich arch bar and stainless steel wires performed under local anaesthesia by oral and maxillofacial surgeon. In this procedure, using 2 sterile gloves is common practice to increase the protection against possible perforations and piercing wounds and help maintain operative asepsis⁶. We performed comparative and randomized analysis of single and double gloving in terms of protection against perforation during Erich arch bar intermaxillary fixation with stainless steel wires performed by oral and maxillofacial surgeon.

Material and methods:

This clinical prospective randomized study was done Oral & Maxillofacial Department, Dhaka Medical College Hospital, Dhaka, during 2014 and 2015 tenure. The management of maxillofacial fracture by placement of Erich arch bar with stainless steel wires to comparative analysis of single and double-gloving protection during intermaxillary fixation under local anaesthesia. 62 consecutive patients with maxillofacial fracture attend Oral & Maxillofacial department, Dhaka Medical College Hospital. The study groups were classified according to the type of glove used. In group 1. Single surgical glove were used. In group 2. Double surgical gloves were used.

Glove perforation was evaluated by filling each glove with half liter of water, and then applied slight pressure on the glove with the palm and fingers. The number of perforations, evidenced by water flow through the holes, was counted. The same examiner performed all the evaluations.

Both the surgeons and the assistants were questioned about their perceptions or suspicions regarding glove perforation time and evaluation of any discomfort while wearing gloves. The perforations found were associated with surgeon gender and dominated hand, most frequent areas and durations of surgical procedure. Wilcoxon, Mann-Whitney and binomial statistical tests were used to evaluate the results.

Results:

A total of 372 gloves were used in this study where 152 perforations were found, with group 1. Single gloves 96 perforations were found and group 2. Double gloves 50 outer perforations and 6 inner gloves perforation were found. Of the single gloves used 96 perforation were found among them 52 surgeon and 44 assistant was slightly higher in surgeons. And double gloves used 56 perforations were found, among here also surgeon more perforation than assistant. In double gloves user that is group 2. Perforations were lower in number against single glove user that is group 1, The distribution of perforation showed (Table-I) a slight prevalence in the surgeon (54%). No accidents with a sharp edged instruments occurred. The difference among single and double glove perforations was significant at 1% (Wilcoxon's test).

Table-I

Number of perforations in the single and double gloves

| Procedure | Surgeon | Assistant | Total |
|---------------|---------|-----------|-------|
| Single gloves | 52 | 44 | 96 |
| Double gloves | 30 | 26 | 56 |
| Total | 82 | 70 | 152 |

*Significant statistical difference at 1% (Wilcoxon's test).

The average length time (ALT) of the procedure was 92 minutes (range 60 to 120 minutes). There was no significant statistical difference between the two gloving groups (Mann-Whitney test; $\alpha = 0.5$) when comparing the number of perforations and the durations of surgical procedure. Almost all of the surgical procedures (84%; 27/32) than took more time than the ALT produced perforations, average 3.1 holes per procedure for the single glove method (Table-II). About 81%(22/27) of the procedure took less time than the ALT produced perforations, with

Table-II
Number of perforations compared with duration of procedure

| Procedure duration | Total procedures | % | Procedures with perforations | % |
|----------------------|------------------|-------|------------------------------|----|
| Up to 90 minutes | 30 | 48.39 | 22 | 73 |
| 90 minutes or longer | 32 | 51.61 | 27 | 84 |

*There was no significant statistical difference among the procedures with perforations of the occurrence above or below the Mann-Whitney test ($\alpha = 0.5$).

an average of 1.8 holes per procedure for the double glove methods. The distribution of perforations according to surgeons sex showed 66 perforations in the female gloves (38 in 20 female surgeons and 28 in 24 female assistants), for an average of 1.5 perforations per practitioner. The male gloves had a total of 86 perforations (46 in 42 male surgeons and 40 in 38 male assistants) for an average of 1.075 perforations per practitioner. No statistical significant difference between the sexes was observed (Mann-Whitney test $\alpha = 0.5$).

In single glove procedure, the surgeons and assistants in the early procedures comfort from wearing glove, with adaptation occurring as the study continued. Majority was sure had sustained a perforation. In double gloves methods of subjective assessment, the surgeons and assistants in the early procedures related slight discomfort from wearing double gloves, with adaptation occurring as the study continued without compromising the surgical procedures. No one was absolutely sure whether he or she had sustained a perforation in an inner or outer glove. Only 6 surgeon suspected that they had sustained a perforations in the outer gloves; testing confirmed all of them had in fact sustained perforations.

Comparing dominant and nondominant hands demonstrated a statistical significant difference at 1% (binomial test). In single glove method, the nondominant hand sustained 71% (68/96) of the dominant 29% (28/96). In the double gloves method nondominant hand 68% (38/56) and the dominant hand 32% (18/56) perforations (Table-III). More than half of the perforations occurred on the index finger (47.37%; 72/152), with 61 (84.72%) of these on the nondominant hand and 11 (15.28%) on the dominant hand. The distal phalanges had the highest perforation rate (56/152), with 47 on the nondominant hand and 9 on the dominant hand.

Table-III
Hand compared with perforations

| Hand | Single glove perforations (%) | Double gloves perforations (%) |
|-----------------|-------------------------------|--------------------------------|
| Dominant (a) | 28 (29) | 18 (32) |
| Nondominant (b) | 68 (71) | 38 (68) |

Note: a x b shows a significant statistical difference at 1% (binomial test).

Discussion:

Pieper et al⁷ confirmed a higher efficacy from wearing 3 gloves compared with double period wear. Many author recommended wearing 2 gloves during surgical procedures using sharp edged instruments^{1,4,8}. A protection index was achieved in the present study using gloving, but decrease comfort and dexterity and numbness of the finger occurring after a short double gloving wearing 2 gloves did not impair the surgeons ability to handle surgical instruments or place Erich arch bar. Single glove method perforation occurred during Erich arch bar procedure almost double compare to double gloving methods. Despite the lack of statistical difference in accidental perforations in both gloving groups in long and short procedures, more perforations occurred in surgeries lasting more than 90 minutes. In oral and maxillofacial surgery procedures, the incidence of glove perforations seems to be more closely associated with the type of surgical procedure than with the duration of surgery. Handling the sharp instruments like Erich arch bars increase the risk of glove perforation so drastically that perforations could be found within a few minutes after the start of surgery. Thus changing gloves at regular intervals is recommended⁹, as well as obviously whenever as evidence of accidental perforation is suspected or noticed. Many authors changing glove every 120 minutes^{3,5,8,10}, but the result from this study strongly suggest changing gloves as shorter intervals when placing Erich arch bars for intermaxillary fixation under local anaesthesia. A glove after the placement in each dental arch would be quite reasonable. The low number of perforation in the inner gloves perforations demonstrates the effectiveness of protection affordable by double gloving surgical methods. Group 2. shows higher efficacy than Group 1. The use of clean, nonsterile procedures gloves for minimum invasive surgery procedure is viable and free of risk of infection or complications. Giglioet al⁶ found no difference in terms of postoperative infection control from wearing sterile and nonsterile gloves during tooth extractions.

The slightly higher rate of perforations in the female practitioners compared to male practitioners was not statistically significant, reflecting a similar ability of each gender to perform this type of procedures. The rates of accidental perforations noticed at the moment that they occurred at the range from 50% to 98% of the previous reports^{1,4,16}. In the present study, all suspected accidental perforations were confirmed to the actual perforations (3.95%; 6/152). This dictates changing gloves not only when a perforation is actually seen, but also whenever the practitioners think that perforation may have occurred. Although double-gloving decrease the practitioner's ability to detect a perforation when it occurs, the increased protection afforded by the practice, along with the minimal decreases dexterity and comfort, offset the relative disadvantages. In terms of the distribution of the perforation by the time of day when the procedure was performed. The incidence of glove perforation on the nondominant hand was 69.7% (106/152) and was most common on the index finger. In fact according to Burke et al¹², when placing oral sutures, glove perforation occur most often on the index finger. The high rate of perforation of the index fingers on the nondominant hand is well known, due to the use of them for support and protection of soft tissues^{1,13}. Thus caution is recommended during Erich arch bar placement, along with proper use of surgical instruments, such as separators and tweezers, instead of the fingers.

Conclusion:

Use of single gloving method for placement of Erich arch bar placement strongly discourages. Double gloving has been shown to be effective in protecting against perforation. Changing gloves whenever a perforation is suspected and once a dental arch is completed is recommended.

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A study to compare the fracture between cast post and prefabricated threaded post

Osmani MSA¹, Sultana A², Pathan IRU³, Rahman MM⁴

Abstract:

The purpose of this study was to compare the fracture between cast post and prefabricated threaded post. A prospective study was conducted in the Department of Prosthodontics, BSMMU, Dhaka, 40 patients were selected who attended in this Department for treatment of extensively damaged natural crown of teeth as the subject of this study and divided equally in to 2 groups. In group A, 20 patients treated with dowel crown using cast post and in group-B, 20 patients treated with prefabricated threaded post. After 12 months, patients clinical sign and symptoms were recorded. A detailed clinical and radiological examination were done. Recorded data were compiled on a master sheet and statistically analyzed. Significant differences were found among two groups by fracture of tooth. 95% had no fracture in group A, and 70% had fracture in group B. From this study after assessing all findings it may be concluded that cast post is better alternative to prefabricated threaded post.

(Bangladesh Dental Journal 2012; 28: 5-8)

Introduction:

Endodontically treated teeth have significantly different physical and mechanical properties compared to vital teeth. It is assumed that endodontically treated teeth are weaker and more prone to fracture because of desiccation or premature loss of moisture supplied by a vital pulp. Post have been advocated to strengthen weakened endodontically treated teeth against intra oral forces. The post distributed torquing forces within the radicular dentin to the supporting tissue along their roots.¹

When an endodontically treated tooth is prepared for a full veneer crown, substantial amount of tooth structure is lost. In order to increase its resistance and support the crown, a dowel core can be inserted. A dowel core has two parts namely a dowel and a core. The dowel is the screw

component, that is inserted into the root canal and core is the retentive component which behaves like a prepared crown for the placement of a retainer. A dowel/post provides the necessary amount of retention and acts as a substitute for the lost tooth structure.² If a substantial amount of coronal structures are missing, a cast post and core is indicated. A metal post is used which provides the necessary retention for the core. Retention of post is affected by post length, design, diameter, shape, surface texture etc. The length of the post should be 2/3 of the length of the root or 1/2 of the root. Otherwise retention will be lost & also fracture of the metal post may occur. For longevity of a dowel post affect the root fracture. Post design and ferrule effect have a direct relation to the root fracture. Studies revealed that Tapered free fabricated threaded post. Increased root fracture than cast post. The post replaces any lost coronal tooth structures of the tooth preparation. The shape of the residual coronal tooth structures combined with the core, should results in an ideal shape for the preparation.³

Cast posts are usually fabricated as tapered design for convenience of canal preparation to conform to the shape of natural root canal. For this reasons, these types of posts are more conservative of tooth structure and minimize the chance of perforation of apical root during canal preparation. Cast post core has a high strength and better adaptation with prepared surface of root so chance of micro leakage is also less than prefabricated threaded post.³

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Prefabricated threaded post are made by metal, carbon fibre, ceramic and glass fibre etc. Ceramic and glass fibre provides esthetic alternatives to metal post. The prefabricated dowels are extensively used in multirouted teeth to support amalgam and composite core buildup.³ The base metal prefabricated post & core causes vertical/oblique root fracture as they electrolytic action of dissimilar metals due to lack of corrosive resistance properties.

To achieve better retention and fracture resistance of restored teeth, the cast post is preferred in damaged or broken teeth alternative to prefabricated threaded post.

Objective:

To evaluate the fracture of post and tooth by horizontal and vertical pressure.

Materials and methods:

A prospective comparative study was conducted in the Department of Prosthodontics, Faculty of Dentistry, Bangbandhu Sheikh Mujib Medical University. The total duration of study was from January 2005 to December 2006. Patients attending in the Out Patient Department of Prosthodontics of BSMMU for the treatment of extensively broken or damaged natural crown of teeth were included

in the study. The sample size was 40 and selected them by random sampling. Total 40 patients were divided into 2 groups. Group–A consisted of 20 patients and treated with dowel crown using Cast post and Group–B consisted of 20 patients and treated with dowel crown using pre fabricated threaded post.

Study procedure:

The patients were selected and evaluated by dental, medical, clinical and radiographical examination The parameter observed, studied and compared between two groups of patients under the reference of standard measure:

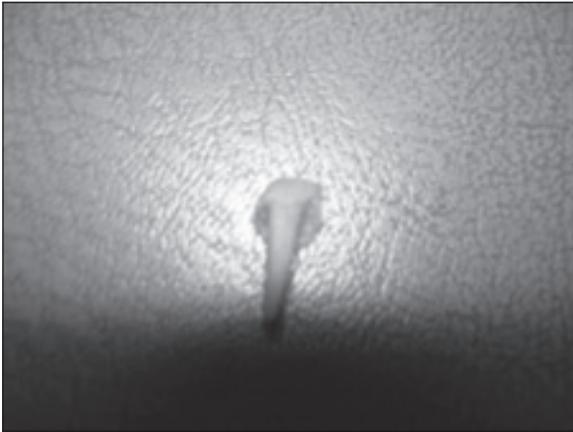
Fracture of Post and tooth evaluated by clinical and radiological examination. It is also evaluated by horizontal and vertical pressure on the margin of the crown with explorer. No movement was observed with vertical and horizontal pressure on the post core.

Results:

Results were expressed by means of table, graded and coded results, on basis of condition of prosthesis and development of diseases, were distributed in groups by number and percentages. The observed result of a table was also tested for statistical significant.

| Fracture of the tooth | Group A (n=20) | | Group B(n=20) | | Chi-square/ p-value |
|------------------------|----------------|-------|---------------|-------|--------------------------|
| | No. | % | No. | % | |
| After 3 months | | | | | |
| No fracture | 20 | 100.0 | 20 | 100.0 | |
| Crack only | 0 | 0.0 | 0 | 0.0 | |
| Break down | 0 | 0.0 | 0 | 0.0 | |
| Total | 20 | 100.0 | 20 | 100.0 | |
| After 6 months | | | | | |
| No fracture | 20 | 100.0 | 19 | 95.0 | |
| Crack only | 0 | 0.0 | 1 | 5.0 | |
| Break down | 0 | 0.0 | 0 | 0.0 | |
| Total | 20 | 100.0 | 20 | 100.0 | 1.03/0.311 ^{ns} |
| After 12 months | | | | | |
| No fracture | 19 | 95.0 | 15 | 75.0 | |
| Crack only | 1 | 5.0 | 3 | 15.0 | |
| Break down | 0 | 0.0 | 2 | 10.0 | |
| Total | 20 | 100.0 | 20 | 100.0 | 4.33/0.037* |

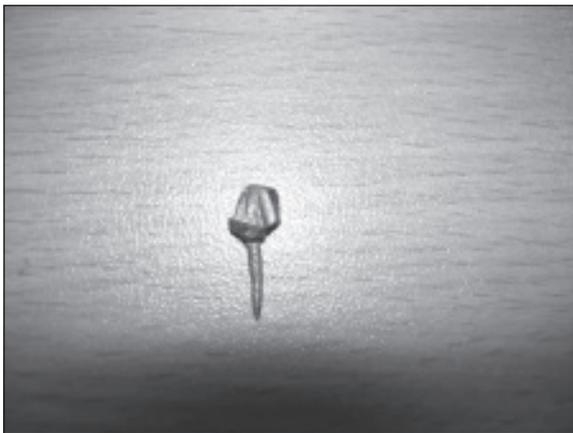
Case No. 1



Intraoral periapical



Cementation of post and core

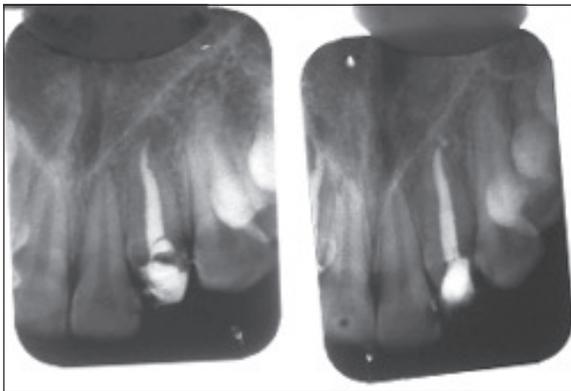


Cast metal post & core

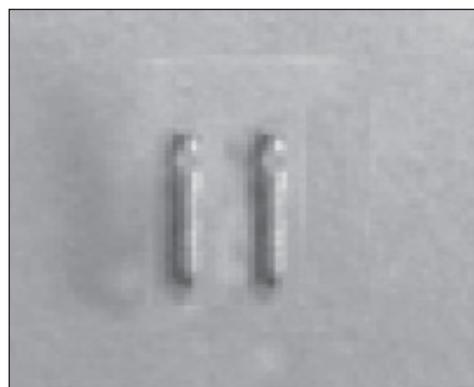


Finally cementation of crown in patient's mouth.

Case No. 2



Radiograph after root canal completion



Pre-fabricated threaded post



Cast metal crown trial



Finally cementation of crown in patient's mouth

Discussion:

Study population was divided into two groups. Total number of selected patients was 40. Two groups of patients were treated with two types of post. In group-A 20 patients were treated by dowel crown with cast post and in group-B, 20 patients were treated by prefabricated threaded post. Evaluation was done after 3 months, 6 months and 1 year. Both groups were compared in every follow-up visits according to the selected parameter. Regarding fracture criteria of tooth, in both the groups of patients (100%) had no change of the both groups, whereas after 6 months of follow up 5.0% had crack only in group-B, and the rest had no fracture of the tooth in the two groups, and on 12 months 95% had no fracture on group-A whereas 75% had fracture on group-B respectively.

Conclusion:

In this study two groups of patients were treated by dowel crown with cast post and prefabricated threaded post. The incidence of fracture of the prefabricated threaded post in higher than that of the cast post. So, it can be concluded that in endodontically treated teeth with extensively damaged natural crown, cast post is the better acceptable alternative to prefabricated threaded post.

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Comparison of Fiber-reinforced composite crowns and Metal ceramic crowns according to status of fracture

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Abstract:

Back ground: Fiber reinforcement was introduced to clinical dentistry for the first time in the 1960s when investigators attempted to reinforce polymethyl- methacrylate dentures with glass or carbon fibers. It has recently been shown that crowns, bridges and posts made of FRC can be used successfully in dental practice and they possess adequate flexural modulus, flexural strength and fracture strength. **Aims:** A prospective comparative cross-sectional study was performed involving 60 patients who attended in the out patients department of Prosthodontics, Faculty of Dentistry, BSMMU during the period of January 2007 to December 2008. **Objective:** Compare status of fracture of fiber-reinforced composite crowns and metal ceramic crowns. **Methods:** Clinical data were recorded from the randomly selected 60 patients divided in to tow groups “experimental” and “control”. Esthetic status was indexed after California Dental Associations quality evaluation system. **Results:** The age of patients ranged between 18 and 42 years in group A and 17 and 38 years in group B. The highest number of patients was in the age group 21-30 years in both groups. The mean age was 24.9±5.8 years and 25.0±4.8 years in group A and group B respectively. There were 26 male and 34 female patients in the study groups and male female ratio was 1:1.3. In group A patients, 12(40.0%) were male and 18(60.0%) female. In group B patients 14(46.7%) were male and 16(53.3%) were female. After 4 months all the patients were in grade I in both groups. After 8 months 29(96.7%) patients were in grade I in group A and 30(100%) patients were in grade I in group B. The difference was not statistically significant ($p>0.05$) in chi square test. After 12 months 30(100%) patients were in grade I in group A and 29(96.7%) patients were in grade I in group B. The difference was not statistically significant ($p>0.05$) in chi square test. **Conclusion :**The Fiber Reinforced Composite crown represents a valuable development in field of Prosthetic Dentistry.

Key words: Status of fracture, Fiber reinforced composite crown, Metal ceramic crown.

(Bangladesh Dental Journal 2012; 28: 9-13)

Introduction:

Metal-ceramic crowns are clinically successful¹. But the visibility of metal and the change in natural tooth translucency is aesthetically unfavorable. The desire for natural looking restorations has encouraged research in the last decades on metal-free, tooth colored materials for dental restorations².

As early all-ceramic restorations exhibited high failure rates,³ an alternative has been seen in the use of reinforced composite materials. In recent years, there have been several in vitro⁴⁻⁶ and in vivo studies^{7,8} of the properties of these composites and promising results have been reported for crowns,⁹ and for fixed partial dentures.¹⁰

However, although these materials seem to provide excellent aesthetics,¹¹ some authors do not recommend composite materials for permanent restorations,^{12,13} because of their unstable aesthetics, their increased wear¹⁴ and their liability to plaque accumulation.¹⁵

With the introduction of fiber reinforced composites, it seemed to be possible to eliminate these disadvantages of composites and to exploit their advantages, including the simple laboratory procedure, the lower costs and the possibility of repair.

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Additionally, this new generation of composites has given promising in vitro results with respect to color change,¹⁶ wear¹⁷ and fracture resistance.¹⁸

The objective of this present prospective clinical study was then the assessment of the clinical performance of esthetic status of a new experimental fiber reinforced composite anterior crowns, compared with a metal–ceramic control group.

The objective of this present prospective clinical study was then the assessment of the clinical performance of a new experimental fiber reinforced composite anterior crowns, compared with a metal–ceramic control group according to fracture status.

Methods:

Participants for this study were recruited from patients visiting the Department of Prosthodontics Faculty of Dentistry, BSMMU during the period of January 2007 to December 2008. The university's review board approved the study and all patients signed an informed consent form. Criteria for including was-Fracture teeth with healthy periodontal tissue, Discolored anterior teeth, Endodontically treated tooth (Root canal treated tooth), Abrasion, erosion of anterior teeth and excluding- Excluding premolar and molar teeth, Periodontally compromised teeth, Para functional habit (bruxer), Vertical fracture, Grossly damage teeth, Developmentally defective teeth; all evaluated by the examiner.

Clinical treatment – at chair side and laboratory procedures followed a standardized scheme. After the removal of old restorative materials and caries excavation, the teeth were built up according to the manufacturer's instructions.

Adaptation of Fiber – Pre impregnated resin, flat & Unidirectional Dentapreg fiber strip manufactured by Prestige Dental UK was used for fabrication of framework of crown. Bucco-linguallay length of the restoration was measured by scale & Dentapreg fiber strip was cut down according to measurement.

Covering paper of Dentapreg strip was removed and adapted one side of the fiber –reinforced composite (FRC) on the buccal side teeth and visible light (Litex) was applied for 20 seconds. Then the fiber –reinforced composite was shaped and adapted slowly lingual side teeth and light

curing was applied for 20 seconds. Then the transparent plastic protective film on the strip was removed.

Composite build up By the incremental way the hybrid veneering composite (ceramic nano-Densply) was applied over the abutments/die and light curing was applied for 40 seconds. The medial and distal proximal contact was made up with the help of cellophane strip. Gingival embrasure was prepared by the application of standard dental wedges. Final light curing, shaping, polishing and finishing were done by standard ways. The fiber Reinforced Composite full veneer crown was polished by standard composite plastic polisher and light cure bonding agent.

Cementation The inside of the crown of Fiber Reinforced Composite (FRC) was sand blasted with aluminum oxide. The internal surface was then treated with a bonding agent and delivered with a low viscosity, hybrid, and composite luting agents. These luting agents were bonded to the inside of the crown to the etched dentine and enamel of the abutments.

Procedure of Metal Ceramic crown: The tooth reduction was done in all aspect with ideal procedure. Impression was taken with alginate. Cast was poured with die stone. Die was prepared with ideal method and trimming was done for wax pattern. Waxing was done with inlay casting wax. Investing and casting were done with standard procedure. Metal framework was tried in for proper fit. Porcelain was bonded over metal framework. Porcelain bonded prostheses was trailed. Final polishing and glazing was done.

Cementation was done with Glass-inomer luting cement. Instruction was given to the patients and advised them to report after 4 months, 8 months and 12months interval. Esthetic status was indexed after California Dental Associations quality evaluation system¹⁹.

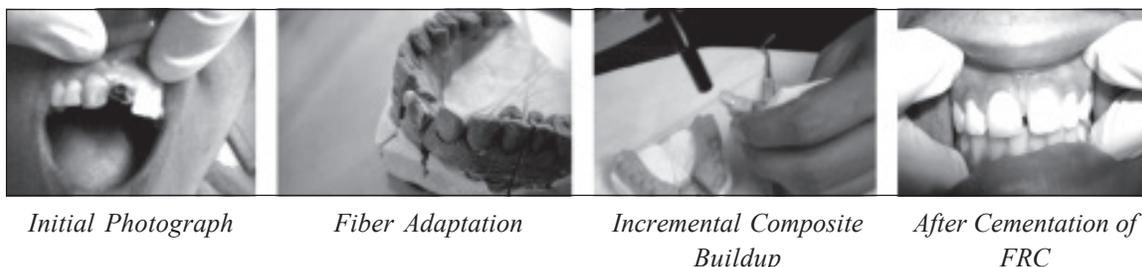
Fracture status (longevity):

Grade I: No Fracture

Grade II: a) Chipping out composite or porcelain
b) Hair line fracture

Grade III: Crown fracture

Study Procedure: Each patient of group-A was treated with Fiber Reinforced Composite Crown and group-B was treated with Metal Ceramic full veneer crown. After completion of the treatments, patients were advised to report after 4 months, 8 months, and 12 months for follow up.



Data Collection: Necessary data were collected from the patients who attended to report their prostheses condition after 4 months, 8 months and 12 months.

Data analysis: All the relevant collected data was compiled on a master chart first. After coding and editing, the collected data was analyzed by using statistical package for social science (SPSS). The result was presented in tables. Chi-square test was done by using Epi Info (version 12). Results of significance were expressed as P-value. P-value <0.05 was considered as significance.

Results:

The observational study was done after 4 months, 8 months and 12 months interval of the cementation of crowns and data were collected according to selected parameters of fracture status. Collected data of different parameters was presented in tabulated form and statistical analysis was done to observe the statistical significance.

Table-I
Distribution of patients by age (n=60).

| Age (year) | Group A (n=30) | | Group B (n=30) | |
|------------|----------------|------|----------------|------|
| | n | % | n | % |
| <20 | 6 | 20.0 | 6 | 20.0 |
| 21 – 30 | 18 | 60.0 | 19 | 63.3 |
| 31 – 40 | 5 | 16.7 | 5 | 16.7 |
| >40 | 1 | 3.3 | 0 | 0.0 |
| Mean ±SD | 24.9 | ±5.8 | 25.0 | ±4.8 |

Group A- Fiber Reinforced Composite crown
Group B- Metal ceramic composite crown
Figure in the parenthesis indicate corresponding percentage
n = number of subjects

The table and figure shows the age distribution of both groups patients of the study. The age of patients ranged between 18 and 42 years in group A and 17 and 38 years in group B. The highest number of patients was in the age group 21-30 years in both groups. The mean age was 24.9±5.8 years and 25.0±4.8 years in group A and group B respectively.

Table-II
Distribution of patients by sex (n=60).

| Sex | Group A(n=30) | | Group B(n=30) | | pvalue |
|--------|---------------|------|---------------|------|----------|
| | n | % | n | % | |
| Male | 12 | 40.0 | 14 | 46.7 | 0.602 NS |
| Female | 18 | 60.0 | 16 | 53.3 | |

Statistical analysis was done by chi square test
Group A- Fiber Reinforced Composite crown
Group B- Metal ceramic composite crown
Figure in the parenthesis indicate corresponding percentage
n = number of subjects
NS = not significant

In this study, both male and female patients were treated in both groups. There were 26 male and 34 female patients in the study groups and male female ratio was 1:1.3. In group A patients, 12(40.0%) were male and 18(60.0%) female. In group B patients 14(46.7%) were male and 16(53.3%) were female. The difference was not statistically significant (p>0.05) in chi square test.

Table-III
Distribution of patients according to status of fracture of full veneer crown after 4 months (n=60).

| Fracture status | Group A(n=30) | | Group B(n=30) | | p value |
|-----------------|---------------|-----|---------------|-----|---------|
| | n | % | n | % | |
| Grade – I | 30 | 100 | 30 | 100 | |
| Grade – II | 0 | 0.0 | 0 | 0.0 | - |
| Grade – III | 0 | 0.0 | 0 | 0.0 | |

Statistical analysis was done by chi square test
Group A= Fiber Reinforced Composite crown
Group B= Metal ceramic crown
n= number of subjects
Figure in the parenthesis indicate corresponding percentage
NS= not significant
Grade I: No Fracture
Grade II: a) Chipping out composite or porcelain
b) Hair line fracture
Grade III: Crown fracture

Table-III shows distribution of patients according to the status of fracture of full veneer crown. After 4 months all the patients were in grade I in both groups.

Table-IV

Distribution of patients according to status of fracture of full veneer crown after 8 months (n=60).

| Fracture status | Group A(n=30) | | Group B(n=30) | | p value |
|-----------------|---------------|------|---------------|-----|---------------------|
| | n | % | n | % | |
| Grade – I | 29 | 96.7 | 30 | 100 | 0.500 ^{NS} |
| Grade – II | 1 | 3.3 | 0 | 0.0 | |
| Grade – III | 0 | 0.0 | 0 | 0.0 | |

Statistical analysis was done by chi square test

Group A= Fiber Reinforced Composite crown

Group B= Metal ceramic crown

n= number of subjects

Figure in the parenthesis indicate corresponding percentage

NS= not significant

Grade I: No Fracture

Grade II: a) Chipping out composite or porcelain
b) Hair line fracture

Grade III: Crown fracture

Table-IV shows distribution of patients according to the status of fracture of full veneer crown. After 8 months 29(96.7%) patients were in grade I in group A and 30(100%) patients were in grade I in group B. The difference was not statistically significant ($p>0.05$) in chi square test.

Table-V

Distribution of patients according to status of fracture of full veneer crown after 12 (n=60).

| Fracture status | Group A(n=30) | | Group B(n=30) | | p value |
|-----------------|---------------|-----|---------------|------|---------------------|
| | n | % | n | % | |
| Grade – I | 30 | 100 | 29 | 96.7 | 0.500 ^{NS} |
| Grade – II | 0 | 0.0 | 1 | 3.3 | |
| Grade – III | 0 | 0.0 | 0 | 0.0 | |

Statistical analysis was done by chi square test

Group A= Fiber Reinforced Composite crown

Group B= Metal ceramic crown

n= number of subjects

Figure in the parenthesis indicate corresponding percentage

NS= not significant

Grade I: No Fracture

Grade II: a) Chipping out composite or porcelain
b) Hair line fracture

Grade III: Crown fracture

Table-V shows distribution of patients according to the status of fracture of full veneer crown. After 12 months 30(100%) patients were in grade I in group A and 29(96.7%) patients were in grade I in group B. The difference was not statistically significant ($p>0.05$) in chi square test.

Discussion:

The prospective comparative study was conducted among the patients who fulfilled the inclusion criteria's. The patients were attended in the outpatient department of Prosthodontics faculty of Dentistry at Bangabandhu

Sheikh Mujib Medical University, from January 2007 to December 2008. Total 60 patients were included in this study among them, 30 patients were in group-A, who treated with Fiber Reinforced Composite Crown and another 30 patients were in group-B who treated with Metal ceramic full veneer crown. The main objective of this study was to compare the effect of Fiber Reinforced Composite Crown and Metal ceramic full veneer crown

After cementation of Prosthesis the patients were requested to come and maintain follow up visit after 4 months, 8 months and 12 months interval and Data were collected according fracture status of the Prosthesis.

The age ranged of both groups was from 17 to 41 years. The highest number of patients was in the age of 21-30 years in both groups.

In this study out of 60 patients, 26 were male and 34 were female and male female ratio was 1:1.3.

Regarding to the status of fracture of crowns, after 4 months, all the patients were in grade-I i.e. no fracture, in both groups. After 8 months, only 1(3.3%) patient of group-A were in grade-II and rest of the patients of both groups were in grade-I. After 12 months, only 1(3.3%) patient of group-B was in grade – II and rest of the patients of both groups were in grade-I. The difference was not statistically significant ($p>0.05$) in chi square test. Regarding fracture status of group-A, after 8 months one patient was in grade-II that is chip out composite (palatal surface in right canine) because the proper thickness of composite was not maintained during fabrication and the patient had multiple missing teeth in posterior region both arches. Due to missing posterior teeth the mastigatory force was exerted onto the FRC crown during functional movements. In that case to overcome the problem the posterior missing teeth was replaced and the chip out portion was repaired intraorally by maintaining proper thickness and the next follow up visit of the patient showed that there was no fracture in the FRC crown.

M. Behr et al²⁰ observed that three types of fiber-reinforced composite (FRC) molar crowns were tested on their fracture resistance. The fracture resistance of molar crowns made of glass-fiber reinforced composite was higher than those of polyethylene fiber-reinforced composite crowns. However, there was no statistically significant difference.

Chul-Whoi et al studied on compare of the fracture strengths of metal-ceramic crowns and 3 types of ceromer crowns. Ten crowns for each of 3 ceromer systems were fabricated from the same metal die. Their fracture resistance

was tested in a universal testing machine. The load was directed at the incisolingual line angle, at 130 degrees to the long axis of each specimen, until catastrophic failure occurred. A 7-mm diameter was used to load the artificial crowns. Metal-ceramic crowns fractured at significantly higher values than ceromer crowns ($P_{.05}$). No significant difference was found among the fracture values of fiber reinforced crowns.

Previous study on effect of Fiber reinforced composite in fixed partial denture (FPD) was conducted in the Department of Prosthodontics at BSMMU, among forty patients divided into two groups. In that study it was showed that there were no change in esthetic status and no attrition of opposing teeth. Only 2(10.0%) patients were found to chip out composites. Fiber reinforced composite fixed partial denture is an innovative alternative to conventional metal ceramic fixed partial denture²¹.

Conclusion:

The Fiber Reinforced Composite crown represents a valuable development in field of Prosthetic Dentistry. This study indicates Fiber reinforced composite crown provide better fracture resistance. As well as it provides life like esthetical appearance, good marginal adaptation and no attrition of opposite teeth. It is a time saving restoration, easy to repair and cost effective.

Recommendations:

Within the limitations of this study it is strongly recommended that Dentists can use Fiber Reinforced Composite crown to ensure esthetically pleasant and durable restorations.

The following recommendations are put forward for the establishment of the procedure:

- a) The study should be conducted on a long term basis. A larger period of observations is required to test the hypothesis.
- b) As it is a technique sensitive restoration so proper curing and high strength composites should be used to increase the longevity of the prostheses.
- c) The study conducted only at BSMMU among the small group of patients, the additional study with large sample size should be done for further conclusion of this result.

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Prevalence of Ciprofloxacin resistance among Gram-negative bacilli isolated from urinary tract infection specimens at a specialist hospital in Riyadh, Saudi Arabia

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Abstract:

Background: Different classes of antimicrobials including fluoroquinolones have shown resistance in a multitude of bacterial species in the hospitals & in the community. Decreased susceptibility to fluoroquinolones arises mainly by single step mutations in the *gyrA* & *parC* genes, which encode the fluoroquinolones targets, the topoisomerase enzymes conferring cross resistance to all fluoroquinolones. Accumulation to multiple mutations in several genes confers increasing level of resistance associated with clinical failure. However, even low level resistance can generate therapeutic failure. Some mobile elements with a potential for the horizontal transfer of the quinolone resistance genes were described in 1998. The loci which are responsible for this plasmid-mediated quinolone resistance, which have been designated as *qnr A*, *qnr B* & *qnr S*, have been identified in the Enterobacteriaceae species. **Aim:** To evaluate the susceptibility pattern of the isolates to various antibiotics & to know the prevalence rate of Ciprofloxacin resistance in our hospital. **Materials & Methods:** A total of 510 gram-negative bacilli (GNB) were isolated from clinical specimens of UTIs over a period of six months (from January 2006 to June 2006) were subjected to antibiotic susceptibility testing. Isolates with resistance or with a decreased susceptibility to Ciprofloxacin (20 mm) were then screened for their minimum inhibitory concentration (MIC) by using the E-test. **Results:** Out of 510 GNB, 97 (19%) isolates were resistant to Ciprofloxacin. The MIC of these isolates ranged from 4 to 32 µg/ml. **Conclusion:** The resistance rate of Ciprofloxacin was 19% in our study. Most of the Ciprofloxacin resistant isolates were from urinary tract infections (UTI) of hospital patients both (indoor & outdoor). The Ciprofloxacin resistance was also closely associated with multi-drug resistance, thus limiting the treatment options. Ciprofloxacin resistance can be used as a general surrogate marker of multi-drug resistance, thus limiting the already restricted treatment options. The considerably high MIC values for Ciprofloxacin in this study reflected the extent of the treatment problems for these resistant isolates & a need for the continuous evaluation of the commonly used antibiotics.

Key Words: Gram-negative bacilli, MIC, Fluoroquinolone, Ciprofloxacin.

(Bangladesh Dental Journal 2012; 28: 14-17)

Introduction:

There were major therapeutic advance of fluoroquinolone antimicrobials in 1980, because they have 100 fold greater activities than their parent compound, Nalidixic acid. Unlike Nalidixic acid, which is used only for urinary infections & occasionally for shigellosis, the fluoroquinolones have a broad range of therapeutic indications & are given as prophylaxis, e.g., in veterinary medicine fluoroquinolones are used as treatment. Early researchers thought that fluoroquinolones resistance was unlikely to evolve, largely

because resistant Esch.coli mutants are exceptionally difficult to select in vitro & because plasmid-mediated quinolone resistance remained unknown even after 30 years of Nalidixic acid usage. Nevertheless multi-national quinolone resistance emerge in Staphylococci & Pseudomonads, which are inherently less susceptible than Esch.coli. More recently, fluoroquinolone resistance has emerged in Esch.coli & other Enterobacteriaceae, contingent on multiple mutations that diminish the affinity of its topoisomerase II & IV targets in varying ways reduce permeability & up regulate efflux. Plasmid-mediated quinolone resistance has been reported but it is exceptional.

Ciprofloxacin is an antibiotic which is used in UTIs & active against gram-negative bacteria, which belongs to the fluoroquinolone class. Bacterial resistance is a growing therapeutic problem, both in the community & in the hospitals, involving all the antibiotics, which include fluoroquinolones. A decreased susceptibility to fluoroquinolones arises mainly due to a single-step mutations in the *gyrA* & the *parC* genes, which encode the

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fluoroquinolone targets, the topoisomerase enzymes. In 1998, some mobile elements which were responsible for the horizontal transfer of the quinolone resistance genes were described. This study was undertaken to evaluate the susceptibility to GNB to various antibiotics & to know the prevalence rate of Ciprofloxacin resistance in our hospital.

Materials & Methods:

A total of 510 gram-negative bacilli were isolated from clinical specimens of UTIs i.e., urine samples (mid-stream & morning sample), from urinary catheters, supra-pubic puncture & was received in the Bacteriology Laboratory over a period of six months (January'2006 to June'2006) were subjected to the study. Specimens were processed using different media like Sheep Blood Agar, MacConkey's Agar & Cystine Lactose Electrolyte Deficient (CLED) Agar. All isolates were identified by using standard biochemical kits, API 20E (Analytical Profile Index System, La Balme Les Grottes, France), & the fully automated analyzers such as PHOENIX, MICROSCAN & VITEK II were also used for the identification & sensitivity pattern of the pathogens. Antibiotic sensitivity testing was performed mainly by using the fully automated analyzers (Phoenix, Microscan & Vitek II) & also sometimes by using the disc diffusion method on 85 mm Mueller-Hinton Agar (Oxoid) plates with agar depth of 4 mm. The bacterial suspension that was prepared for antibiotic sensitivity testing on Mueller-Hinton Agar or for the fully automated analyzers (Phoenix, Microscan & Vitek II) was adjusted to the recommended turbidities for all species. The antibiotics tested on each disc were Ampicillin (25mg), Amoxicillin-Clavulanic Acid (20-10 mg), Trimethoprim-Sulphomethoxazole (1.25-23.75 mg), Cephalothin (30 mg), Cefuroxime (30 mg), Cefotaxime (30 mg), Cefepime (30 mg),

Ciprofloxacin (5 mg), Norfloxacin (30 mg), Nalidixic Acid (30 mg), Gentamicin (10 mg), Amikacin (30 mg), Tazocin (Piperacillin+Tazobactam), Imipenem (30 mg). The Clinical Laboratory Standards Institute (CLSI) break points were used for interpretation of susceptibility patterns as sensitive & resistant. Isolates with resistance or decreased susceptibility to Ciprofloxacin (20 mm) were considered as resistant & subjected to further study. The study design & protocol was approved by "Research & Ethics Committee" of the institute. The resistance to Ciprofloxacin was confirmed by break point minimum inhibitory concentration (MIC in µg/ml) by using E-test strips & also by the fully automated analyzers (Phoenix, Microscan & Vitek II). The isolates with MIC value >32 mg/ml were defined as resistant isolates, as outlined by CLSI guidelines.

Results:

Esch. coli (30.5%) was the most predominant isolate which was found among the GNB, followed by Klebsiella pneumoniae (24.5%), Proteus species (16.4%), Pseudomonas aeruginosa (9.2%), Acinetobacter species (7.8%), Enterobacter species (6.2%), Citrobacter species (3.2%), Morganella morganii (1.2%), & Serratia marcescens (1.0%) as shown in Table-I.

The lowest level of resistance was observed for Tazocin (06%) followed by Imipenem (05%). The resistance rate of Ciprofloxacin was 19%. The MIC of Ciprofloxacin for these isolates ranged from 4 to >32µg/ml (Table-III)

The isolated bacteria showed wide differences in their susceptibility to Ciprofloxacin. A high rate of resistance to Ciprofloxacin was observed among Ps.aeruginosa, Acinetobacter spp., K.pneumoniae & Proteus spp. followed by Esch.coli.

Table-I

Total number of Gram-Negative Bacilli isolated from clinical specimens of UTIs (n=510)

| SL.No. | Antibiotics | Total no of Sensitive isolates % | Total no of Resistant isolates % |
|--------|-----------------------------------|----------------------------------|----------------------------------|
| 1. | Ampicillin | 82 (16%) | 428 (84%) |
| 2. | Cephalothin | 127 (25%) | 383 (75%) |
| 3. | Amoxicillin-Clavulanic Acid | 153 (30%) | 357 (70%) |
| 4. | Trimethoprim-Sulphamethoxazole | 194 (38%) | 316 (62%) |
| 5. | Cefuroxime | 316 (62%) | 194 (38%) |
| 6. | Cefotaxime | 331 (65%) | 179 (35%) |
| 7. | Cefepime | 382 (75%) | 128 (25%) |
| 8. | Norfloxacin | 403 (79%) | 107 (21%) |
| 9. | Nitrofurantoin | 408 (80%) | 102 (20%) |
| 10. | Nalidixic Acid | 357 (70%) | 153 (30%) |
| 11. | Ciprofloxacin | 413 (81%) | 97 (19%) |
| 12. | Gentamicin | 393 (77%) | 117 (23%) |
| 13. | Amikacin | 413 (81%) | 97 (19%) |
| 14. | Tazocin (Piperacillin+Tazobactam) | 479 (94%) | 31 (06%) |
| 15. | Imipenem | 484 (95%) | 26 (05%) |

Table-II
Antibiotic susceptibility pattern of isolates to various antibiotics (n=510)

| SL.No. | Organism | Total no | of isolates | Percentage (%) |
|--------|------------------------|----------|-------------|----------------|
| 1. | Escherichia coli | 155 | | 30.5% |
| 2. | Klebsiella pneumoniae | 125 | | 24.5% |
| 3. | Proteus species | 84 | | 16.4% |
| 4. | Pseudomonas aeruginosa | 47 | | 9.2% |
| 5. | Acinetobacter species | 40 | | 7.8% |
| 6. | Enterobacter species | 32 | | 6.2% |
| 7. | Citerobacter species | 16 | | 3.2% |
| 8. | Morganella morganii | 06 | | 1.2% |
| 9. | Serratia marcescens | 05 | | 1.0% |
| | Total | 510 | | 100% |

Table-III
MIC values of the resistant Gram-Negative Bacilli to Ciprofloxacin (n= 97)

| Ciprofloxacin MIC values | 4 µg/ml | 8 µg/ml | 16 µg/ml | 24 µg/ml | 32µg/ml |
|--------------------------|----------|----------|----------|----------|---------|
| Total no. of isolates | 18 (20%) | 12 (12%) | 14 (14%) | 15 (15%) | 38(39%) |

Discussion:

The rapidly rising rates of fluoroquinolone-resistant Esch.coli in many parts of the world has been found due to the reduced susceptibility to the quinolones. The Surveillance Network database (<http://www.sur-net.world.com>) shows resistance trends in blood-stream isolates from 250 U.S. hospitals as follows: Esch.coli, 1.8% in 1996 & 4.3% in 1999; Klebsiella spp., 7.1% in 1996 & 6.7% in 1999; Enterobacter spp., 6.6% in 1996 & 6.5% in 1999; & Proteus mirabilis, 5.7% in 1996 & 12.7% in 1999. High rates in Esch.coli may reflect contamination via the food chain; the Spanish study found quinolone-resistant Esch.coli & 90% of chicken feces & noted similar fecal carriage rates of resistant Esch.coli in children & adults. There is a small set of drugs commonly used to treat Ps.aeruginosa infection, including Ciprofloxacin, Tobramycin, Amikacin, Gentamicin, Ceftazidime, Piperacillin, Tazocin & Imipenem. While Ps.aeruginosa has developed various levels of resistance to each of these, its response to Ciprofloxacin is of particular interest because the drug is initially very effective, but Ps.aeruginosa rapidly acquires high level resistance rendering the drug important.

The resistance rates for Ciprofloxacin was 19% in our study. Most of the resistant isolates were obtained from UTI samples. This may be because of fluoroquinolones are preferred as the initial agents for empiric therapy in UTI, because of their excellent activity against the pathogens which are commonly encountered in UTI. This emphasizes the importance of the re-assessment of the antibiotics which are used in the empiric treatment of UTIs. Most of the isolates from UTIs were susceptible to Nitrofurantoin, Nalidixic Acid, Amikacin, Imipenem. This was in agreement with the finding of a study reported by Astal E, 2005.

These data suggests that Nitrofurantoin can still be successfully used in the treatment of UTI. The Ciprofloxacin resistance was also closely associated with multi-drug resistance. Hence, it severely limits the already restricted treatment options. The finding was in accordance with the finding of a study which was conducted by Paterson *et al.* The high resistance pattern which was seen in our study was probably due to the inappropriate prescribing of antibiotics (sometimes without doing culture & sensitivity tests), lack of antibiotic policy & the poor

infection control strategies. But the antibiotic history could not be properly elicited from the patients in this study.

Ciprofloxacin remains a potent antibiotic; but the slow accumulation of resistant *Enterobacteriaceae* is disturbing, not least because resistance is a class effect, affecting all fluoroquinolones. Ultimately, this resistance may be partly overcome by the efflux pumps that contribute to the resistance but this strategy is still several years from fruition. In the interim, the best approach lies in the prudent use of fluoroquinolones in humans & animals, coupled with an emphasis on preventing patient-to-patient spread of resistant strains.

The antibiotic which showed maximum activity against most of the isolates was Imipenem & Tazocin. Though Carbapenems remain the final options for treating these infections, there is a possibility that the increasing use of Carbapenems may lead to a rapid emergence of Carbapenems resistance.

Conclusion:

The considerably MIC values for Ciprofloxacin, in this study, reflect the scope of limited treatment options which are available for these resistant isolates & a need for the continuous evaluation of the commonly used antibiotics. Repeated surveillance, the formulation of an antibiotic policy, the prudent prescriptions of antibiotics & the recycling of antibiotics are the possible routes which can be used to curb the rapid emergence & the spread of these resistant isolates.

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The prevalence of Methicillin Resistant Staphylococcus Aureus (MRSA) in the infected wound of patient and nasal colonization of medical staff in the Oral and Maxillofacial surgery ward

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Abstract:

The study conducted at the department of Oral and Maxillofacial surgery in Dhaka Dental College Hospital, BSMMU, Shaheed Shohrawardi Hospital, Dhaka Medical College Laboratory, Dhaka, Bangladesh with a view to determine the current trend and status of MRSA infection and carrier stage as well as its prevalence and risk factors both in patients & hospital staff. On study 31.3% patients were infected by MRSA and 12.2% staffs were colonized by MRSA. During study total staphylococcus identified 64.5% were MRSA and 35.5% were MSSA in patients and among the staffs out of the staphylococcus identified, 15.9% were MRSA and 84.1% were MSSA. Higher age group is identified as a predictor for risk of MRSA infection. In other group previous hospitalization, increased length of hospital stays and history of taking broad spectrum antibiotic were found to be associated with occurrence of MRSA infection. In patients, vancomycin was the single drug found to be highly sensitive against staphylococcus and MRSA as well. Next in the place were Gentamicin and Ceftriaxone. Erythromycin and penicillin seems to be the least sensitive. Among the medical staff, most staphylococcus was sensitive to Gentamicin, Ciprofloxacin, Ceftriaxone and Vancomycin.

Key words : MRSA, MSSA, Staphylococcus.

(Bangladesh Dental Journal 2012; 28: 18-21)

Introduction:

MRSA is a strain of staphylococcus aureus resistant to methicillin, oxacillin & cephalosporin. It rapidly develops resistance to many other antimicrobial agents and its prevention of infection is more important than other pathogen.

Risk factors for prevalence of MRSA are: previous and prolonged hospitalization, advanced age, prior or prolonged antibiotic therapy, malnutrition and chronicity of infected wound.¹

Infected & colonized patient provides the primary reservoir and transmission is mainly through hospital staffs carrying the organisms in the skin and anterior nares.²

In maxillofacial surgery ward many patients are admitted with abscess, cellulitis, facial space infection, chronic osteomyelitis, postoperative wound infection etc. Above infected patient gives history of prolong facial infection with discharging sinus and prolonged injudicious use of antibiotics and previous hospitalization. So it is a suitable condition to get emergence of MRSA in the department.

Materials and Methods:

It was a cross sectional study carried out at the Oral and Maxillofacial surgery department of Dhaka Dental College & Hospital, BSMMU, Shaheed Shohrawardi Hospital, Dhaka Medical College Laboratory, Dhaka during the period of January 2005 to December 2006). Patient were selected with wound infection (Preoperative and postoperative) and hospital personnel irrespective of age and sex who fulfilled the inclusion and exclusion criteria. Specimens as swab were taken from the infected wound of admitted patients and nasal swab were taken from the medical staff. The results of the experiments were recorded systemically. Statistical analysis was performed using Chi-square (χ^2) test and "t" test.

Laboratory Procedure

Isolation of organisms from specimen:

a) Gram staining : All the specimens were stained by Gram staining & examined under microscope.

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b) Culture: All the specimens were inoculated into Blood agar, MacConkey agar and additional selective media ie, Mannitol salt agar (MSA) for staphylococci was also used. The plates were incubated aerobically at 37^{0c} C for 18-24 hours. Single isolated colonies of different bacteria were picked up & subcultured in order to get pure colonies.

c) Isolation & identification of organism: Identification of organism was done on the basis of growth character, colony morphology, Gram staining, motility test & different biochemical tests eg. Catalase test, Coagulase test, oxidase test. uraese test, fermentation test, reaction in KIA agar & simmon’s citrate agar etc.

e) Detection of MRSA: All the isolated Staphylococcus aureus strains were subjected to oxacillin disc diffusion test. MRSA was detected by oxacillin disc diffusion method using 1mg disc. A zone of inhibition of less than 10mm indicates resistance to methicillin.

d) Antimicrobial susceptibility test: Antimicrobial susceptibility tests of all isolated Staph. aureus strains and other Gram positive and Gram negative aerobic organisms were done by Disc diffusion method against the following antimicrobial agents commonly used in the Oral & Maxillofacial surgery department using the Mueller Hin ton agar media (Modified Kirby-Bauer Technique).



Fig.-1: Chronic osteomyelitis of Mandible

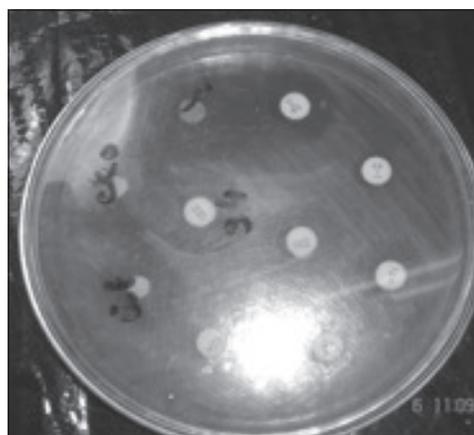


Fig.-2: Antibogram of MRSA in mueller-Hinton agar media.

Results & Observations:

Table-I
Distribution of Type of staphylococci

| Types of staphylococci | Patient | | Staff | | Total | |
|------------------------|---------|------|-------|------|-------|-----|
| | No | % | No | % | No | % |
| MRSA | 20 | 64.5 | 11 | 15.9 | 31 | 31 |
| MSSA | 11 | 35.5 | 58 | 84.1 | 69 | 69 |
| Total | 31 | 100 | 69 | 100 | 100 | 100 |

Table-III
Distribution of the patients by history of taking antibiotic.

| History of taking antibiotic | Frequency | Percent |
|------------------------------|-----------|---------|
| Yes | 56 | 87.5 |
| No | 8 | 12.5 |

Table-III
Comparison of duration of hospital stay and duration of antibiotic use between the patients with positive and negative MRSA

| Variable | MRSA | N | Mean±SD | t | df | P value |
|----------------------------------|----------|----|---------------|-------|----|----------|
| Duration of hospital stay (days) | Positive | 20 | 2845.0±1400.1 | 2.058 | 62 | 0.044(S) |
| | Negative | 44 | 3306.8±1317.2 | | | |
| Duration of antibiotic use | Positive | 18 | 14.89±10.03 | 2.045 | 52 | 0.046(S) |

Table-IV
Antibiotic sensitivity of MRSA among patients

| Antibiotic | Sensitive | | Resistant | |
|---------------|-----------|------------|-----------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Amoxicillin | 3 | 15 | 17 | 85 |
| Erythromycin | 1 | 5 | 19 | 95 |
| Gentamycin | 12 | 60 | 8 | 40 |
| Ciprofloxacin | 7 | 35 | 13 | 65 |
| Vancomycin | 19 | 95 | 1 | 5 |
| Cephadrine | 1 | 5 | 19 | 95 |
| Cloxacilin | 5 | 25 | 15 | 75 |
| Penicillin | 3 | 15 | 17 | 85 |
| Ceftriaxone | 9 | 45 | 11 | 55 |

Table-V
Antibiotic sensitivity of MRSA among staff

| Antibiotic | Sensitive | | Resistant | |
|---------------|-----------|------------|-----------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Amoxicillin | 1 | 9.1 | 10 | 90.9 |
| Erythromycin | 3 | 27.3 | 8 | 72.7 |
| Gentamycin | 3 | 27.2 | 8 | 72.7 |
| Ciprofloxacin | 7 | 63.6 | 4 | 36.4 |
| Vancomycin | 11 | 100 | 0 | 00 |
| Cephadrine | 5 | 45.5 | 6 | 54.5 |
| Cloxacilin | 5 | 45.5 | 6 | 54.5 |
| Penicillin | 1 | 9.1 | 10 | 90.9 |
| Ceftriaxone | 5 | 45.5 | 5 | 45.5 |

Discussion:

Out of 64 patients, 20 (31.3%) cases were affected by MRSA and out of 90 staffs, 11 (12.2%) cases were colonized by MRSA. Among patients, *S. aureus* was detected in 31 cases, of them, 20 (64.5%) were MRSA and the rest 11 were MSSA. Esuvaranathan et al. (1992)³ found 50% *S. aureus* isolated from the wound infection, were resistant to Methicillin. While Doebbeling (1995)⁴ reported 72% MRSA. So, in the current study, the prevalence of MRSA was rather among the highest group but not among the lowest.

Among medical staff, *S. aureus* were detected in 69 (76.7%) cases, of them 11(15.9%) were MRSA. The result is in

accordance with Avery et al. (2000)⁵ from Saudi Arabia where the isolation was 18.3%. A higher rate was reported by Saxena et al. (2002) from India (25%).⁶

Most MRSA were of higher age group and it is found to be associated with increased age ($P < .05$) where as no sex difference have been evident. Lu et al. (2005) also identified age as a risk factor.

In the present study, previous hospitalization was identified as a predictor ($P < .01$) for risk of MRSA infection. Several studies also illustrated the relationship of previous or prolonged hospitalization history with increased risk of having MRSA.⁷

Out of 64 subjects, 56 (87.5%) had taken antibiotics before. However patients with MRSA on an average took antibiotics for 4.72 days more and stayed 4.57 days more at hospital in comparison to their non MRSA counterpart ($P < .05$). Current study findings almost echoed the observation of Doebbeling BN (1995).⁴ His study suggested higher frequency of severe underlying disease, Prior antibiotic therapy, and prolonged hospitalization increases the risk of MRSA bacteremia, particularly in post operative patients.

Among the 20 patients with MRSA infection, Vancomycin was found to be 95% sensitive against MRSA. Next in the place was Gentamicin (60%) and Ceftriaxone 45%. Esuvaranathan et al. (1992) also found vancomycin most sensitive to MRSA 100%. Current study findings seem to have imitated the results of Jahan et al. (2004).⁸

Among the 11 staff with MRSA, Vancomycin was found to be the highly sensitive (100%) against MRSA, next in place were sensitive to ciprofloxacin 63.6% and Ceftriaxone 54.5%.

Vancomycin seems to be the only antimicrobial agent which showed highest sensitivity & may be used as the drug of choice for treating multidrug resistant MRSA infection.

Conclusion:

From the present study it may be concluded that, there is an alarmingly high incidence of MRSA in hospitalized patients. Nasal carriage rate of MRSA among hospital staffs is also high. MRSA is multiple drug resistance, susceptibility test should be performed with all commonly used anti-staphylococcal drugs and then appropriate drug

should be selected to prevent development of resistant to additional drugs. Regular monitoring of antibiotic sensitivity pattern of MRSA and formulation of definite antibiotic policy for a hospital will helpful in reducing incidence of MRSA infections.

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Marginal fit of shoulder and chamfer finish line of metal crown

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Abstract:

Background: Marginal fit is very important for the longevity of restoration. The junction between the cemented restoration and the tooth is always a potential site for recurrent caries, gingivitis and periodontitis and ultimately failure of crown as well as teeth.

Hypothesis: Shoulder finish line for anterior teeth and chamfer for posterior teeth are equally effective.

Objectives: To evaluate the marginal gap of metal crown at two locations (facial/buccal and palatal/lingual) around the margin.

Methods: Thirty extracted human teeth were prepared with shoulder margin (group-A) and another thirty teeth were prepared with chamfer (group-B) as methodically. Metal crown was fabricated by lost wax technique of casting procedure. All of the crowns (both group-A and group-B) were cemented by glass ionomer luting cement as their respected teeth. Each crown was sectioned in faciolingual direction at the midpoint of each surface by slow speed isomet saw. The sectioned crowns were examined under scanning electron microscope for measurement of marginal gap. Data were collected on the basis of marginal gap of each crown was compared. Collected data were processed and analyzed using SPSS (Statistical Package for Social Service) version 12.

Results: The mean differences of marginal gap at facial/buccal and palatal/lingual midpoint were statistically significant between two groups.

Conclusion: Shoulder finish line for anterior teeth had better marginal fit than chamfer finish line for posterior teeth.

(Bangladesh Dental Journal 2012; 28: 22-26)

Introduction:

The portion of tooth which is covered by enamel is known as crown. There are three types of crown: anatomic crown, clinical crown, artificial crown. Portion of natural tooth that extends from its cemento-enamel junction to the occlusal surface or incisal edge is called anatomic crown. The portion of natural tooth that extends from the bottom of the sulcus to the occlusal surface or incisal edge is called clinical crown. The entire part of natural teeth that restores anatomy, function and esthetics, usually metal, porcelain, synthetic resin or combination is called artificial crown.

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Marginal accuracy is considered a crucial factor in the success and longevity of a cast restoration. Ideally, cemented cast restoration margin should precisely meet the finish line of the prepared teeth with non detectable junctions. Practically clinical perfection is difficult to achieve and difficult to verify¹. A cast crown is considered satisfactory when it presents suitable anatomical form, correct polishing and adequate marginal adaptation². Successes depend on the marginal adaptation of the casting, the surface of the margins and the luting cement used.

The accuracy of the casting will be determined by the preciseness of the previous construction procedure such as the impression, the construction of the gypsum die, the waxing technique, the investment technique and the casting procedure³.

The objective of luting cement is to fix the casting to the preparation and to seal the gap between the crown and preparation. One of the greatest shortcomings of dental luting cements is high solubility rate and their permeability. The excellence of the finish line depends on the accurate finish of the preparation³.

The presently used preparation margins are shoulder, chamfer, shoulder bevel, knife edge, slope shoulder etc.

The requirements of preparation are minimum width of 0.5 mm for prepared margins, bevel angulations between 30 degrees and 45 degrees for optimum margin closure, smooth surface on prepared margins, preparation without overextension or unsupported enamel and easy to identification in the impression or on the die.

Smooth prepared margins can be identified easily on the die. Rough prepared margins may cause incomplete fit of cement, decreasing cement solubility. After crown cementation, the cavosurface angle of the margin may not be covered by cement. The margin must be as smooth as possible to reduce accumulation, vitro studies can help to estimate the marginal adaption of different type of margin¹.

An in vitro study with a stainless-steel device show minimal marginal opening averaged 114 and 93 um acceptable by a group of prosthodontists⁴.

Marginal fit is very important because the junction between the cemented restoration and the tooth is always a potential site for recurrent caries due to the dissolution of luting agent and the inherent roughness. If the adaption of restoration of teeth is more accurate, lesser the chance of recurrent caries or periodontal disease, ultimately the longevity of the restoration is increased⁵. Special measurements of these gaps can be compared to the theoretical zero. Minimal dimension for the gaps were not determined clinically; consequently there are no existing standard for measures these gaps⁵.

The study evaluate the marginal fit of shoulder finish line for anterior teeth and chamfer for posterior teeth. In this study human teeth were selected because human teeth are usually restored by easily available metal alloy or composite resin. The properties of most artificial substitutes are not often as those of human teeth⁵. Nickel-chromium-Beryllium (NiCrBe) alloy were used because of its biocompatibility, high mechanical strength, less clinical inconvenience, satisfactory resistance to corrosion, make these alloy more appropriate structural materials than other alloys.

Materials & methods:

This observational in vitro study was carried out in the Department of Prosthodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Department of Materials & Metallurgical Engineering, Bangladesh University of Engineering & Technology (BUET), Dhaka.

Freshly extracted human anterior and posterior teeth were divided into 2 groups each containing 30 teeth. In Group A: This group consisted of maxillary anterior teeth with

shoulder margin. In Group B: This group consisted of maxillary posterior teeth with chamfer margin, well formed healthy and freshly extracted human maxillary teeth are selected for the study.

Research instruments and materials:

Scanning Electron Microscope
Slow speed isomet saw
Alginate
Dental stone
Glass ionomer cement
NiCrBe Alloy

Clinical procedure:

The teeth selected were immersed in 1% solution in a screw capped glass vial for two days to remove any organic debris from the root surface as well as for preservation.

All teeth were carefully cleaned to eliminate tartar, calculus, stain and remained tissue with the help of ultrasound scaler. Then the specimens were again immersed in 1% sodium hypochlorite for 24 hours. After 24 hours, the cleaned teeth were stored in normal saline prior to tooth preparation for the study.

Tooth preparation was carried out methodically. Then all teeth were immersed in normal saline.

Tooth Preparation:

The reduction of teeth were done by following biologic & mechanical consideration. Enamel was reduced from all surfaces of teeth for metal crown.

Facial reduction:

Depth orientation grooves were placed on the labial and incisal surface with the flat end tapered diamond. The grooves were 1.2 mm deep on the labial surface and 2 mm deep in the incisal edge. The labial grooves were cut with the diamond held parallel to the gingival one third of the labial surface. A second set of two grooves was made parallel to the incisal two third of the uncut labial surface. The labial surface of all metal preparation is done in two planes to achieved adequate clearances for good esthetics without encroaching the pulp.

The gingival portion of labial surface is reduced 1.2 mm depth by the flat end tapered diamond bur. This reduction extend around the labiproximal line angles and fade out on the lingual aspect of the proximal surface. The end of the flat end tapered diamond bur will form the shoulder finish line while the axial reduction is done with the side of the diamond. The shoulder margin were minimum of 1.0 mm wide.

Incisal reduction:

The reduction of incisal edge /occlusal surface was done about 2 mm for adequate metal thickness.

Lingual reduction:

Lingual reduction was done carefully with the small wheel diamond. Because over reduction of the junction between the cingulum and the lingual wall was necessary for the retention of the crown.

Proximal Reduction:

Using the round end diamond , proximal reduction was done.

Finish line preparation:

For anterior teeth, 1 mm shoulder margin were done by flat end tapered diamond and for posterior teeth ,chamfer margin were done by torpedo diamond.

Finishing line preparation:

All axial wall were smooth, all sharp angles were rounded line. Care was taken not to create undercut in the axial walls where they join the finish line.

Laboratory Procedure:

Impression of the prepared teeth were taken by irreversible hydrocolloid impression material alginate (lygin, dentamerica, USA) by using stock tray. Working cast and dies were fabricated with the stone. Preparation of dies & metal crowns were made by lost wax technique.

Then all metal crowns were cemented onto their respected teeth by glass inomer luting cement. Then each crown was sectioned with a diamond wafering saw in faciolingual direction at the midpoint of each tooth. Every specimen was examined under a scanning Electron microscope for measurement of marginal gap. Measurement of marginal gap were determined at the facial/buccal and palatal midpoint of each crown. Available data were analyzed statistically. Chi square test and student's t test were performed to detect statistical significance of the study.

P value < 0.05 was accepted as significant.

Results:

Frequency of marginal gap at facial/buccal midpoint in both groups (n=60)

The highest frequency of marginal gap at <50 μm was in group A and at >100 was in group B. At <50 μm the frequency of marginal gap was higher in group A than that of group B & it was statistically significant ($p < 0.01$). At 50-100 μm the frequency of marginal gap was higher in group B than that of group A & it was statistically non

significant. At >100 the frequency of marginal gap was higher in group B than that of group A & it was statistically significant ($p < 0.01$).

Table-I

| Facial/buccal mid point (μm) | Group A n=30 | | Group B n=30 | | P value |
|---|-----------------|------|-----------------|------|---------------------|
| | N | % | n | % | |
| <50 | 24 | 80.0 | 0 | 0.0 | 0.001** |
| 50-100 | 3 | 10.0 | 10 | 33.0 | 0.060 ^{ns} |
| >100 | 3 | 10.0 | 20 | 66.7 | 0.001** |

Group A= shoulder margin, Group B = chamfer margin,** = $p < 0.01$, ns = non significant, N = Total number of subjects

Frequency of marginal gap at palatal midpoint in both groups (n=60)

The highest frequency of marginal gap at 50-100 μm was in group A and at >100 was in group B. At <50 μm the frequency of marginal gap was higher in group A than that of group B & it was statistically significant ($p < 0.01$). At 50-100 μm the frequency of marginal gap was higher in group A than that of group B & it was statistically non significant. At >100 the frequency of marginal gap was higher in group B than that of group A & it was statistically significant ($p < 0.01$).

Table II

| Palatal mid point(μm) | Group A n=30 | | Group B n=30 | | P value |
|------------------------------------|-----------------|------|-----------------|------|---------------------|
| | N | % | n | % | |
| <50 | 6 | 20.0 | 0 | 0.0 | 0.011* |
| 50-100 | 18 | 60.0 | 12 | 40.0 | 0.121 ^{ns} |
| >100 | 6 | 20.0 | 18 | 60.0 | 0.003** |

Group A= shoulder margin, Group B = chamfer margin ,* = $p < 0.05$, ** = $p < 0.01$, ns = non significant, N= Total number of subjects

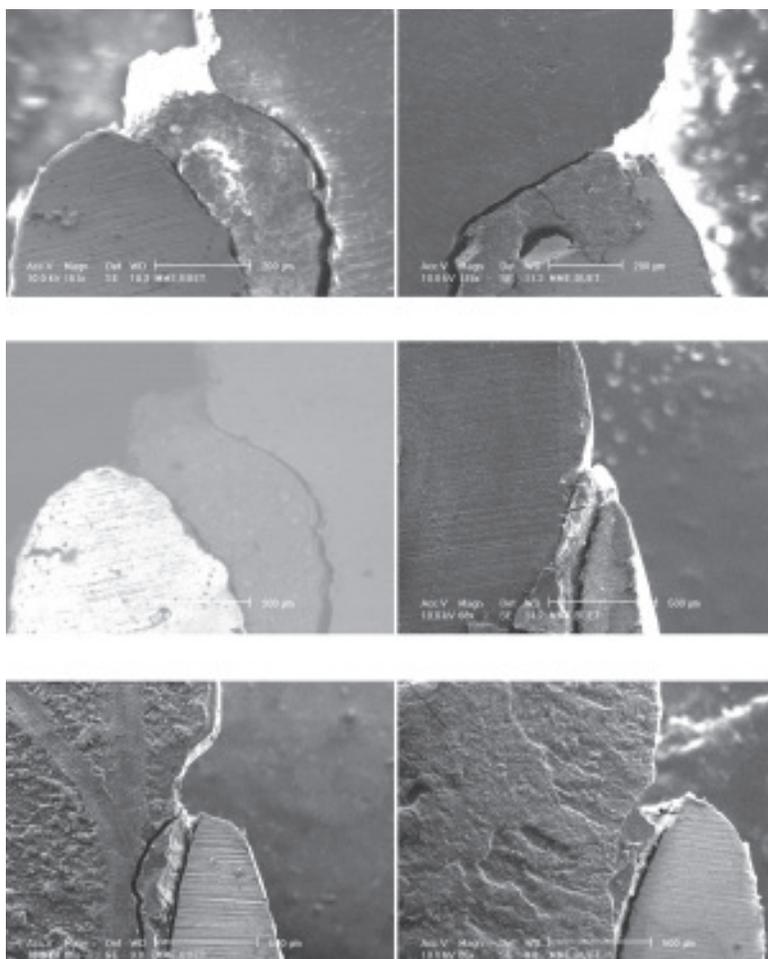
Mean \pm SD of marginal gap at two location of both groups (n=60)

In group A , the mean \pm SD of marginal gap was 50.1 \pm 26.1 μm at facial/buccal midpoint and 80.7 \pm 30.4 μm in palatal midpoint. In group B , the mean \pm SD of marginal gap was 115.5 \pm 21.4 μm at facial/buccal midpoint and 151.3 \pm 52.2 μm in palatal midpoint . In group A mean marginal gap was higher at palatal mid point than that of facial/buccal midpoint and it was statistically highly significant. In group B mean marginal gap was higher in palatal midpoint than that of facial/buccal midpoint and it was statistically highly significant.

Table-III

| | Facial/buccal midpoint (μm)Mean \pm SD | Palatal midpoint (μm)Mean \pm SD | P value |
|---------|--|--|---------|
| Group A | 51.8 \pm 26.1 | 80.7 \pm 30.4 | 0.001** |
| Group B | 115.5 \pm 21.4 | 151.3 \pm 52.2 | 0.007** |

Data were analyzed using unpaired students "t" test, Group A = shoulder margin, Group B = chamfer margin, ** = $p < 0.01$, ns = non significant, N = Total number of subjects



Discussion:

This In vitro study was conducted to evaluate the marginal fit of shoulder margin and chamfer margin for metal crown. Marginal continuity and marginal gaps were observed among the all crowns of this study. The distribution of marginal gap measured and compared at facial/buccal midpoint in both groups. In group A, $< 50 \mu\text{m}$ marginal gap were found in 80% of crowns, 50-100 μm and also $> 100 \mu\text{m}$ marginal gap were found in 10% of crowns. In group B, 50-100 μm marginal gap were found in 33% of crowns, $> 100 \mu\text{m}$ marginal gap were found in 66.7% of crowns, but there were no crown which had $< 50 \mu\text{m}$ of marginal gap. The

distribution of marginal gap measured and compared at palatal midpoint in both groups. In group A, $< 50 \mu\text{m}$ marginal gap were found in 20% of crowns, 50-100 μm were found in 60% of crowns and $> 100 \mu\text{m}$ marginal gap were found in 20% of crowns. In group B $> 100 \mu\text{m}$ marginal gap were found in 60% of crowns, 50-100 μm marginal gap were found in 40% of crowns but there were no crown which had $< 50 \mu\text{m}$ of marginal gap. In shoulder finish line for anterior teeth, mean marginal gap was higher in palatal midpoint than that of facial/buccal midpoint and in chamfer finish line for posterior teeth, mean marginal gap was higher in palatal than that of facial /buccal midpoint. Holmes⁶

states that marginal fit of crown at four locations that is facial, palatal, mesial, distal by using castable ceramic crown and gold crown. They found higher value at facial and palatal midpoint. They also found better marginal fit in ceramic crown than that of gold crown. The present study made similar observation though the material used in this study was nickel chromium beryllium alloy⁶. Blackman⁷ states that marginal fit of metal crown which is made of pure titanium. They measured 0.050 mean marginal gap. The present study made similar observation though in this study steel dies, zinc phosphate cement is used and 45 degree facial and 90 degree palatal margin were made by indirect technique⁷. Petteno⁸ states that marginal fit of crown by using three different metal ceramic systems that were composite alloy, electroforming and high noble alloy⁸. The present study made dissimilar observation because the material used in this study was different. Rosentritt⁵ states that marginal adaptation of crowns which was made ceramic and fixed on natural and artificial teeth. They found better adaptation of natural teeth than artificial teeth⁵. The present study made similar observation because natural teeth were used in this study. Wazzan¹ states that the marginal and internal fit of crown which was made by commercially pure titanium (CPTi) and titanium-aluminium-vanadium (Ti-6Al-4V) alloy cast restorations¹. The present study made similar observation through the material used in this study which was nickel chromium beryllium (Ni-Cr-Be) alloy¹. Petro² states that marginal and internal discrepancy of complete cast crown by using different casting method².

In various studies marginal fit measured and reported in varieties of way, different margin, impression materials, dental stone, investment materials, casting procedure, luting agent, alloy were chosen. In this study alginate, type IV dental stone, conventional casting technique and NiCrBe alloy was selected because these were randomly used in Bangladesh. Every step should be done with great

care and perfectly to avoid gaps or discontinuity as well as misfit⁷.

Conclusion:

Under the completion of the study, Shoulder finish line of anterior teeth and chamfer finish line of posterior teeth of metal crown were successfully adapted. Marginal gap of shoulder finish line anterior teeth and marginal gap of chamfer finish line of posterior teeth were within the acceptable limit. Marginal fit of shoulder finish line anterior teeth was better than chamfer finish line of posterior teeth of metal crown.

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A clinical study of the relationship between Diabetes Mellitus and periodontal disease

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Abstract:

Aim: The present study was to clinically evaluate the relationship of diabetes mellitus with periodontal disease. **Method:** A descriptive type of cross sectional study was conducted to determine the status of periodontitis among the 145 diabetic patient at out patient department of Gonosasthaya Samaj Vittik Dental College and Hospital, Savar, Dhaka. A thorough oral examination was carried out and relevant history was recorded for all the patients. **Study Place & Year:** The study was conducted at out patient department of Gonosasthaya Samaj Vittik Dental College and Hospital, Savar, Dhaka. The total period of the study was January to June 2012. Data were collected from 1st April to 30th April 2012. **Results:** Patient of long term diabetes are high risk of getting periodontitis ($p < 0.001$). Uncontrolled blood sugar is also found significant, out of 98 patients who are not well controlled 59 suffers from moderate to severe periodontitis ($p < 0.001$). In sub group analysis we found periodontitis is highly associated with uncontrolled blood sugar level ($p < 0.05$), not associated with the age of the patients ($p > 0.119$). **Conclusion:** The study shows that diabetic patient are at risk of periodontitis but if the patients are aware of their blood sugar level and regular dental check-up patient will remain safe.

Key words: Periodontitis, Diabetes.

(Bangladesh Dental Journal 2012; 28: 27-30)

Introduction:

Diabetes mellitus is a complicated metabolic disorder characterized by hypofunction or lack of function of the beta cells of the islets of langerhans in the pancreas, leading to high blood glucose levels and excretion of sugar in the urine. Diabetes is the commonest among metabolic disorders and its incidence is on the increase all over the world. It affects 2 to 10% of the human population.¹

Periodontal disease is an infectious and inflammatory disease, which destroys the periodontal tissues. These tissues consist of the gums and the bone that supports the teeth. Periodontal disease has been labeled as the "Sixth Complication" of diabetes¹. But it often goes unrecognized by physicians who treat diabetic patients. People with diabetes are much more susceptible to periodontal disease and once periodontal disease establish in a diabetic patient, metabolic control (blood sugar level

control) of diabetes is complicated from the constant reservoir of gram-negative anaerobic bacteria that sit at the bottom of the gum pockets producing infection and low-grade inflammation throughout the body. That is why the relationship between diabetes and periodontal disease is sometime refer as a two-way street², and the reason why diagnosis and treatment of periodontal disease, just like optimal glycemic control, are essential in the medical management of diabetes.

Diabetic patient who have good control over blood sugar levels (good glycemic/metabolic control) can prevent or delay the onset and slow the progression of the complications associated with diabetes, particularly retinopathy, nephropathy and neuropathy. The same is true for delaying the onset or slowing the progression of periodontal disease. However, for people with diabetes who have poor glycemic control (high blood sugar levels), the risk of infection becomes much greater. For instance it is estimated that poorly controlled diabetic people are at a 2 to 4 times greater risk for developing periodontal infection than non-diabetic people.³ That is why it is important for diabetic patients to achieve and sustain the same level of glycemic control as a healthy, non-diabetic individual. Another important aspect of this two-way street² is, the research that suggests chronic periodontal infection causes systemic inflammation that enhances insulin resistance and hyperglycemia. Insulin

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resistance makes it difficult for patients and their physicians to achieve and sustain optimal glycemic control, and increases the risk for coronary heart disease. Diabetic patients were twice as likely as non-diabetic subjects to have attachment loss.³ Most importantly when a periodontal infection goes untreated in diabetic patients, this puts them at greater risk for developing long-term complications associated with diabetes and cardiovascular disease.⁵ These diseases require frequent monitoring and careful attention to immune system response to treatment, and monitoring of both glycemic control and periodontal status.

Objectives: The study was undertaken in diabetic patients with the following objectives.

1. To find out prevalence and severity of periodontal disease.
2. To determine age influence on the prevalence and severity of periodontal disease.
3. To evaluate the relationship between duration of diabetes and prevalence and severity of periodontal disease.

Materials and Methods:

It was a cross sectional type of study. Data were collected from 145 patients attending at out patient department of Gonosasthaya Samaj Vittik Dental College and Hospital, Savar, Dhaka. Study period was January to June 2012. Pre-tested interview schedule in Bangla were administered to interview the respondents. The investigator interviewed every respondent by asking questions, the medical information was collected by reviewing the diabetic record book, and oral cavity was examined by torch light, dental mirror, dental probe, the attachment loss was measured by periodontal probe. The patients were categorized according to the severity of the periodontitis following the American dental association guideline, the categories are:

- Grade I** : 0-2 mm of attachment loss, No periodontitis
Grade II : 2-4 mm of attachment loss, Mild periodontitis
Grade III : 4-6 mm of attachment loss, Moderate periodontitis
Grade IV : 6-8 mm of attachment loss, Severe periodontitis

And the oral hygiene status is also measured by following the WHO guideline. All the data were analyzed and necessary statistical tests were done using statistical software.

Results:

In this study patients are divided into two groups one that bear blood sugar level in control that is below 8mmol/

dl and other having blood sugar level with out control i.e. more than 8mmol/dl. The study shows that 59 patients develop moderate to severe periodontitis out of 98 patients. On the other hand the group contain blood sugar level below 8 mmol/dl develop moderate periodontitis among the 9 person with in 47 are ($p < 0.001$) which is highly significant, and patients with high blood sugar are at risk of periodontitis.

In sub group analysis, among the duration of diabetes, level of blood sugar, and grade of periodontitis, respondents were divided according to blood sugar level into two groups, one who bearing the blood sugar level less than 9 mmol/dl and other group more than 9mmol/dl. Respondents further divided in two groups, one group is carrying diabetes for 5 years or less and the other group developed at least for 5 years and more.

Table-I

Distribution of the respondents depending on their blood sugar level, grade of periodontitis and duration of diabetes n=77

| Blood sugar level | Grade of periodontitis | Duration of diabetes | |
|-------------------|------------------------|----------------------|-----------|
| | | >5years | <5 years |
| <9mmol/dl | Grade I | 15(38.5%) | 9(31.0%) |
| | Grade II | 18(46.2%) | 7(24.1%) |
| | Grade III | 6(15.4%) | 7(24.1%) |
| | Grade IV | 0 | 6(20.7) |
| P=0.011 | Total | 39 | 29 |
| >9mmol/dl | Grade I | 3(8.6%) | 2(4.8%) |
| | Grade II | 15(42.9%) | 8(19.0%) |
| | Grade III | 14(40.0%) | 17(40.5%) |
| | Grade IV | 3(8.6%) | 15(35.7%) |
| P=0.018 | Total | 35 | 42 |

When this two variable is measured with dependent variable grade of periodontitis, the outcome shows, patient with blood sugar <9mmol/dl and carrying diabetes less than 5 years had higher grade periodontal disease than patient with blood sugar >9mmol/dl and carrying diabetes for less than 5. In both cases we found $p < 0.05$. So blood sugar level plays a significant role in the development of periodontitis.

In another sub group analysis among level of blood sugar, grade of periodontitis, and age group of the respondents. We divide patients according to the blood sugar level and patients age. In a group patients blood sugar level is <9mmol/dl here patients are divided into two groups, <50 years and >50 years. In <50 years group, about 43%

patients are free from periodontitis 2% suffering from severe periodontitis in more than 50 years group 15.8% are free from periodontitis and 26.3% are suffering from severe periodontitis ($p < 0.05$). It is significant that age can cause periodontitis if blood sugar remain control i.e. less than 9 mmol/dl.

Table-II

Distribution of the respondents depending on their blood sugar level, grade of periodontitis and age group n=77

| Blood sugar level | Grade of periodontitis | Age | |
|-------------------|------------------------|-----------|-----------|
| >9mmol/dl | | <50years | >50years |
| | Grade I | 21(42.9%) | 3(15.8%) |
| | Grade II | 18(36.7%) | 7(36.8%) |
| | Grade III | 9(18.4%) | 4(21.1%) |
| | Grade IV | 1(2.0%) | 5(26.3%) |
| P=0.011 | | 49 | 19 |
| <9mmol/dl | | <50years | >50years |
| | Grade I | 4(8.3%) | 1(3.4%) |
| | Grade II | 18(37.5%) | 5(17.2%) |
| | Grade III | 18(37.5%) | 13(44.8%) |
| | Grade IV | 8(16.7%) | 10(34.5%) |
| P=0.119 | Total | 48 | 29 |

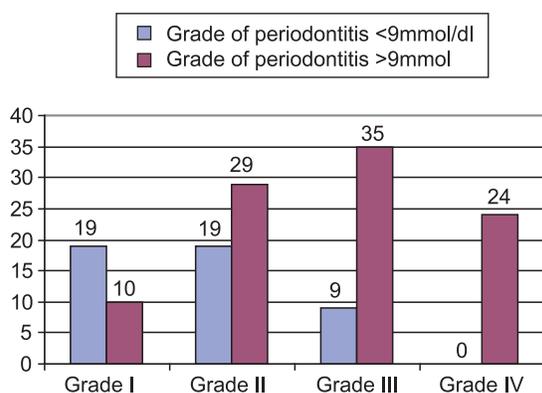


Fig-1: *Distribution of periodontal patients depending on the blood*

In other group patients blood sugar level is >9mmol/dl here patients are divided into two groups, one is less than 50 years and one is more than 50 years. In less than 50 years group 8.3% patients are free from periodontitis and 16.7% suffering from severe periodontitis. in more than 50 years group 3.4% are free from periodontitis and 34.5% are suffering severe periodontitis ($p > 0.05$). Here p value is not significant and showing us that if blood sugar is not in control than periodontitis can occur in any age.

Discussion:

Regarding blood sugar, in this study blood sugar plays a significant role in developing periodontitis ($p < 0.000$). It shows that patient with blood were from sugar under control that is 8 mmol/dl have less chance to developing periodontitis. It shows out of 47 patients who have blood sugar level is below 8mmol/dl are not a single patient suffers from severe periodontitis. Only 6.1% suffers from moderate periodontitis and 13.1% are free from periodontitis. On the other hand, 98 patients with the blood sugar level 8 mmol/dl are suffered more in moderate and severe periodontitis.

The result of this study finds similarity with the study done by T. Tervonen, RC.Oliver¹¹, long term control of diabetes mellitus and periodontitis. National Health and Nutrition Examination Survey, which included thousands of Americans, adults with poorly controlled diabetes had an almost threefold increased risk of having periodontitis compared with that in adult subjects without diabetes, while subjects with diabetes and good glycemic control had no significant increase in risk.

Effects of blood sugar level, and duration on diabetes on periodontitis, the duration of diabetes appears to be an important factor in the evaluation of diabetes as a risk factor for periodontal disease. Patients age 40 to 50 years with type 1 diabetes with long duration exhibited significantly more sites with advanced periodontitis and bone loss than did age matched controls without diabetes.

Poor metabolic control appears to increase the likelihood of periodontitis among people with type 1 diabetes. More than one-quarter subjects with type 1 diabetes with poor metabolic control had sites with attachment loss of 5 millimeters or greater, compared with 10 percent of the subjects with good metabolic control.¹¹ Metabolic control of type 2 diabetes is equally as important, based on data, from the Third national Health and Nutrition Examination Survey, which reported that the odds of having severe periodontal disease in patients with fair-to-good or poor glycemic control were approximately 50 percent or 200 percent higher than the odds among subjects without diabetes, respectively.¹⁰

In this study, we divided the patients according to blood sugar level into two groups, one who bearing the blood sugar level with in control that is below 9mmol/dl and other group having more than 9mmol/dl. Also divide the patients in another two groups, one group is carrying diabetes for 5 years or less and the other group developed at least for 5 years and more. When this two variable are

measured with dependent variable grades of periodontitis, the out come shows, blood sugar level and duration of diabetes suffering both are significant for developing periodontitis.

Effects of blood sugar level, and age of the respondents on periodontitis, patients with poorly controlled diabetes and attachment loss of 2 mm or greater at an average of 24 percent of sites, while patients with good-to-moderate diabetes control had similar levels of attachment loss at only 10 percent of sites.¹ The percentage of sites in patients with well-controlled diabetes, suggesting that patients with well-controlled diabetes may not be at an increased risk of developing periodontal diseases.⁴

In a study of periodontal disease in a Mexican population of people with type 2 diabetes. Researchers conducted that the number of years since diagnosis of diabetes was a more significant factor than, the age of the person. When considering the severity of periodontal disease.⁷

In our study, we divide patients according to the blood sugar level and age of the patient into two groups. In a group patients blood sugar level is <9mmol/dl here patients are divided in two groups one is <50 years and one is >50 years. In <50 years group, we found $p < 0.007$. It is significant that age can cause periodontitis if blood sugar remain control. i.e. less than 9mmol/dl. In other group patients blood sugar level is >9mmol/dl. In this analysis we found $p > 0.05$. Here p value is not significant that showing us that if blood sugar is not in control than periodontitis can occur in any age.

Conclusion:

This study was conduct to explore the magnitude of periodontitis among the diabetic patients, and to investigate the factors, associated with the periodontitis in the urban communities of Bangladesh.

Dental care seeking behavior is reviled to be an important factor that prevent in developing periodontitis. Patients, who didn't visit Dental surgeon for regular check up, and not visited to dental surgeon at least in a year were suffered more in periodontitis. Providing adequate information to the patient about periodontitis and its prevention, is an essential part of any program of preventive dentistry. Motivation is the most important part of education for it has been clearly shown that merely

knowing that, something should be done is not sufficient in itself to cause a person to do it.

Public Dental Health programs seek to achieve dental health in a specific population, and so their administration should involve prevention, treatment, education and supporting researches activities. It is acceptable that in any society, a treatment program without a preventive component can never achieve the long-term objective of dental health for all.

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Practice of oral hygiene of primary school children and its relationship with socioeconomic status of their family at Rajshahi, Bangladesh

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Abstract:

Aim: The Aim of the present study was to assess the level of practices of primary school going children about oral hygiene and its relationship with socio-economic status of their family at the study area Helenabad colony primary school, Rajshahi, Bangladesh. **Method:** The study was cross-sectional and descriptive in design. The sample size of this study was 405 primary school going children of class three to class five of the study area. The study was carried out in the Helenabad Primary School-01 and Helenabad Primary School-02. In order to obtain representative samples, a purposive sampling technique was applied in selecting the study participants among the targeted total population in amid the areas. Nevertheless, it is important to take note of the limitations caused by such methods, in particular the selection bias (Fletcher et al. 1996). To collect the data, direct interview method with respondents is used in this study. The completed questionnaire was collected and checked for the completeness and clarity of the information to exclude missing or inconsistent data and then compiled together. Data was edited properly before analysis. An Excel Spreadsheet as master document was prepared first. Data analysis was done through SPSS 16.0. Final analysis of the data was carried out using percentage, absolute numbers for categorical variables in IBM SPSS 16.0. For some purpose Excel program was also used. **Result:** The study revealed that, out of 405, majority 47% respondents was male and 53% respondents were female. The male - female ratio was 1 : 1.12. Majority 59.8% students belonged to the age group of 9 - 10 years. The mean age of the students was 9.65 ± 1.158 years. It was found that majority of the mothers 84.7% were house wives. We also found that only 13% mothers' occupation were service and the relationship between the level of knowledge on hygiene and mothers occupation of the respondents was not statistically significant ($p > 0.05$). About 56% fathers occupation were service, 38.5% were business man and 5% were day laborer. The study showed that the relationship between knowledge and practice on personal hygiene father's occupation was statistically significant ($p < 0.05$). **Conclusion:** The study was showed that the relationship between economic status of the respondents and practice on oral hygiene was statistically significant ($p < 0.05$).

Key words: Oral hygiene, mother's occupation, father's occupation.

(Bangladesh Dental Journal 2012; 28: 31-37)

Introduction:

Oral hygiene is the cheapest form of preventive health measure. Though cheap, it is surprisingly one of the most ignored in practice especially in the underprivileged rural communities. Poor oral hygiene is known as important

predisposing factor of some oral diseases like cancrumoris, periodontitis, acute nectrotisingulcerative gingivitis (ANUG) and gingivitis¹. School children should have sufficient knowledge of understanding the value of maintaining health practices, which in turn results healthy children for the nation.² To create positive health among them, oro-dental care is to be given as serious thought along with other factors necessary for promotion of health.³ Therefore, to impart knowledge among students regarding formation of dental hygiene is an effective measure in case of school students.⁴

Again, poor oral hygiene, measles, poverty, chronic malnutrition, poor environmental sanitation and unsafe water supply have been identified as risk factor for Noma.⁵ Oral health education like health in general, can work best when the state of the knowledge and the general oral habit of the recipient is taken into account. It imposes a challenge of developing culturally acceptable and sensitive program that has the potential to provide knowledge and develop a

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health attitude in the population concerning oral health or by way of integrating scientific knowledge into traditional oral health beliefs.⁶ There is no nation free from oro-dental diseases, but the pattern of prevalence of the diseases vary from country to country,⁷

Oral hygiene mainly depends on the knowledge of the people. In students, the knowledge and practice of oro-dental hygiene can be raised through child to child education.⁸

Objectives:

General objective:

The study was carried out with a view to assess the level of practices of primary school going children about personal hygiene and its relationship with socio-economic status of their family.

Specific objectives:

- o To assess the level of knowledge about oral hygiene of the primary school going children
- o To describe the status of practice about oral hygiene of the school going children
- o To find out the association between some selected socio-demographic factors and knowledge & practice of oral hygiene of the school going children

Methodology:

Study Design

A descriptive cross-sectional study.

Study population

Boys and girls who are currently studying in class III to class V of Helenabad Primary School-01 and Helenabad Primary School-02.

Study area and site

Helenabad colony is at Ward no.5, PS-Rajpara of Rajshahi City Corporation. The study was conducted in two primary schools of this Helenabad colony, Rajshahi, Bangladesh.

Sample size estimation and sample size

The sample size for this study was 384.

Sampling Technique

Purposive sampling.

Data Collection Tools

Data collection tools were the semi-structured questionnaire.

Data collection procedure

A partially structured questionnaire which was duly pre-tested was used to collect data from the respondents and their oral hygiene condition was examined by the researcher.

Data Management and Analysis plan

After proper verification regarding consistency and validity, data were coded and entered into the computer by using SPSS/PC programme. Data were analyzed according to the objectives of the study by using SPSS/PC+ software computer programme. Descriptive variables were explained with mean and standard deviation. Statistical significance was found by applying relevant statistical tests at appropriate probability level ($p=0.05$ or $p=0.01$)

Results:

The present study has been carried with the objective of assessing the level of knowledge and practice of oral hygiene of primary school going children at Helenabad colony school, Rajshahi and its relationship with socio-economic status of their family. The information was collected from 405 school children by using a questionnaire. The results of the survey have been presented in the following section with tables, charts and description.

Table-I

Frequency distribution of respondents by age group.

| Age group in years | Frequency | |
|--------------------|-----------|-----------------|
| | N | % |
| Less than 9 years | 67 | 16.5 |
| 9-10 years | 242 | 59.8 |
| 11 years and above | 96 | 23.7 |
| Total | 405 | 100.0 \bar{X} |

$\pm SD = 9.65 \pm 1.158$ years

Regarding frequency distribution of study subjects by age group, it was revealed that out of 405, majority of them [242(59.8%)] belonged to the age group of 9 - 10 years of age. It was also found that 67 students (16.5%) were less than 9 years and 96 students (23.7%) were 11 and above years. The mean age of the students was 9.65 ± 1.158 years (Table-I).

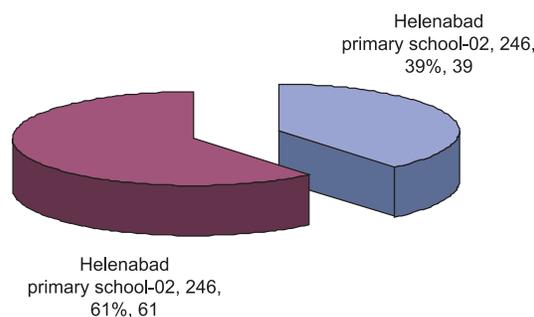


Fig.-1: Distribution of students by name of school (n=405).

The study showed that majority of students [246 (61%)] were from Helenabad primary school-02 and 159 (39%) respondents were from Helenabad primary school-01 (Figure 1).

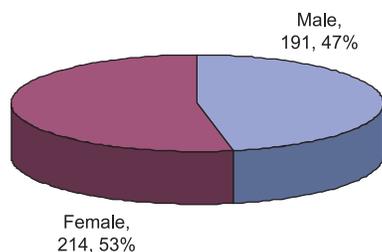


Fig.-2: Distribution of the gender of respondents (n =405)

About distribution of the students by gender, it was found, majority of them [214 (53%)] were female and 191 (47%) respondents were male. The male - female ratio was 1:1.12 (Figure 2).

Table-II

Distribution of respondents by academic class.

| Class | Frequency | |
|-----------|-----------|-------|
| | N | % |
| Class-III | 143 | 35.3 |
| Class-IV | 148 | 36.5 |
| Class-V | 114 | 28.1 |
| Total | 405 | 100.0 |

Regarding frequency distribution of study subjects by class, it was revealed that [143 (35.3%)] students were in class III, [148 (36.5%)] students were in class IV and [114 (28.1%)] students were in class V (Table-II).

Table-III

Frequency distribution of students by religion.

| Religion | Frequency | |
|----------|-----------|-------|
| | N | % |
| Islam | 394 | 97.0 |
| Hindu | 11 | 3.0 |
| Total | 405 | 100.0 |

About frequency distribution of students by religion, it was found that out of 428, majority of them [394(97.0%)] belonged to the religion of Islam. It was also found that 11 students (3.0%) were Hindu (Table-III).

Table-IV

Frequency distribution of respondents by family type.

| Family Type | Frequency | |
|----------------|-----------|-------|
| | N | % |
| Nuclear Family | 288 | 71.0 |
| Joint Family | 117 | 29.0 |
| Total | 405 | 100.0 |

Regarding frequency distribution of the study subjects by family type, it showed that the majority [288 (71.0%)] students came from nuclear family. It was also found from the survey that only 29.0% respondents belonged to the joint family (Table-IV).

Table-V

Frequency distribution of respondents by father's occupation.

| Fathers occupation | Frequency | |
|--------------------|-----------|-------|
| | N | % |
| Service | 228 | 56.3 |
| Day labor | 21 | 5.2 |
| Business | 156 | 38.5 |
| Total | 405 | 100.0 |

Regarding the occupation of the fathers, it was explored that 228 (56.3%) students' fathers were service holder, 21 (5.2.0%) fathers were day laborer, 156 (38.5%) were business (Table-V).

Table-VI

Frequency distribution of respondents by mother's occupation

| Mother's Occupation | Frequency | |
|---------------------|-----------|-------|
| | N | % |
| Service | 53 | 13.1 |
| Day labor | 9 | 2.2 |
| House wife | 343 | 84.7 |
| Total | 405 | 100.0 |

About frequency distribution of students by mother's occupation, it was revealed that, out of 405, majority of the mothers [343 (84.7%)] were house wives, 53(13.1%) were service holder. We also found that only 9 (2.2%) mothers' occupation were day laborer (Table-VI).

Table-VII

Frequency distribution of respondents by monthly family income.

| Monthly income (in Tk.) | Frequency | |
|-------------------------|-----------|-----------------|
| | N | % |
| <7500 | 88 | 22.0 |
| 7500-15000 | 200 | 49.0 |
| >15000 | 117 | 29.0 |
| Total | 405 | 100.0 \bar{X} |

\pm SD = 13539.06 \pm 9440.16 taka.

Regarding monthly family income, 117 (29%) students informed, their monthly family income was Tk. >15,000.00, 88 (22.0%) respondent's monthly family income were less than Tk. 7500.00 and about 49% student's monthly family income was Tk. 7500.00 to 15,000.00 (Table no.7). The mean of monthly family income of the respondents was 13539.06 and Standard deviation 9440.16 Taka (Table-VII)

Table-VIII

Frequency distribution of respondents by cleaning teeth.

| Cleaning Teeth | Frequency | |
|-------------------|-----------|-------|
| | N | % |
| Once daily | 38 | 9.4 |
| Two times daily | 288 | 71.1 |
| Three times daily | 79 | 19.5 |
| Total | 405 | 100.0 |

The study showed that out of 405 students, majority of students [288 (71.1%)] clean their teeth two times daily. It was also found that 79 (19.5%) students clean their teeth three times daily and only 9.4% students clean their teeth once daily (Table-VIII).

Table-IX

Frequency distribution of respondents by time of teeth cleaning.

| Time of teeth cleaning | Frequency | |
|------------------------|-----------|-------|
| | N | % |
| After any meal | 58 | 14.3 |
| After lunch | 19 | 4.7 |
| Before breakfast | 261 | 64.4 |
| Before sleeping | 67 | 16.5 |
| Total | 405 | 100.0 |

Regarding distribution of students by time of tooth brush, it was revealed that out of 405, majority of them [261

(64.4%)] clean their teeth before breakfast. It also showed that 58 (14.3%) students clean their teeth after any meal and 19 (4.7%) students clean their teeth after lunch. Only 16.5% students clean teeth before sleeping (Table-IX).

Table-X

Frequency distribution of respondents by mentioning the name of materials for cleaning teeth.

| Name of materials | Frequency | |
|-------------------|-----------|-------|
| | N | % |
| Tooth paste | 391 | 96.5 |
| Tooth powder | 12 | 3.0 |
| Meswak | 2 | 0.5 |
| Total | 405 | 100.0 |

Table-X showed that the majority students [391 (96.5%)] used tooth paste for cleaning their teeth, 12 (3.0%) students used tooth powder, 2 students used meswak for cleaning their teeth.

Table-XI

Frequency distribution of respondents by mentioning the technique of teeth brushing (Multiple responses) (n = 405)

| Technique of teeth brushing | Frequency | |
|-----------------------------|-----------|-------|
| | N | % |
| Horizontal scrub | 355 | 87.65 |
| Up and down | 280 | 69.13 |
| Others | 25 | 6.17 |

*Increase percentage due to multiple responses.

About distribution of the study subjects by technique of teeth brushing, it showed that 355 (87.65%) respondents mentioned the technique of teeth brushing is 'Horizontal scrub', 280 (69.13%) respondents brushing their teeth up and down and only 25(6.17%) respondents used other technique for brushing their teeth (Table-XI).

Above table shows that out of 405, 228 (56.3%) fathers occupation was service. Among them 29(12.7%) students cleaned their teeth once in a day, 146(60.0%) brushed two times in day and 53(23.2%) brushed teeth three times in day. 21(5.2%) students' fathers were day laborer. Among them 18(85.7%) students' cleaned teeth two times in a day and 3(14.3%) brushed three times in day. It also showed that 156 (38.5%) respondent's fathers were business man. Among them 9(5.8%) students brushed teeth once in a day, 124(79.5%) brushed two times in day and 23(14.7%) brushed three times daily. The study also revealed that

Table-XII
Relationship between father's occupation and tooth brush quantity

| Fathers occupation | Tooth brush quantity | | | Total N (%) |
|--------------------|------------------------|-----------------------------|-------------------------------|----------------|
| | Once in a day N (%) | Two times in a day N (%) | Three times in a day N (%) | |
| Service | 29(12.7%) | 146(60.0%) | 53 (23.2%) | 228(56.3%) |
| Day laborer | 0 (0.0%) | 18(85.7%) | 3 (14.3%) | 21(5.2%) |
| Business | 9 (5.8%) | 124 (79.5%) | 23 (14.7%) | 156(38.5%) |
| Total | 38 | 288 | 79 | 405(100%) |

$X = 14.363, df = 4, p < 0.05$

Table-XIII
Relationship between mother's occupation and tooth brush quantity

| Mothers occupation | Tooth brush quantity | | | Total N (%) |
|--------------------|-----------------------|----------------------------|------------------------------|----------------|
| | Once in a day N(%) | Two times in a day N(%) | Three times in a day N(%) | |
| Service | 4 (7.5%) | 40 (75.5%) | 9(17.0%) | 53(13.1%) |
| Day laborer | 1 (11.1%) | 8 (88.9%) | 0 (0.0%) | 9(2.2%) |
| Housewife | 33 (9.6%) | 240 (70.0%) | 70 (20.4%) | 343(84.7%) |
| Total | 38 | 288 | 79 | 405(100%) |

$\chi^2 = 2.916, df = 4, p > 0.05$

the relationship between father's occupation and brushing teeth was statistically significant ($p < 0.05$) [Table-XII].

The frequency distribution of the study subjects by mother's occupation and teeth brushing, it was showed that out of 405, 53 (13.1%) mothers occupation was service. Among them 4(7.5%) students cleaned their teeth once in a day, 40(75.5%) brushed two times in day and 9 (17.0%) brushed teeth three times in day. 9 (2.2%) students' mothers were day laborer. Among them 8(88.9%) students' cleaned teeth two times in a day and 1(11.1%) brushed once in a day. It also showed that 343(84.7%) respondent's mothers were housewives. Among them 33(59.6%) students brushed teeth once in a day, 240(70.0%) brushed two times in day and 70(20.4%) brushed three times daily. The study also revealed that the relationship between mother's occupation and brushing teeth was not statistically significant ($p > 0.05$) [Table-XIII].

Discussion:

The survey was carried out in the Helenabad Primary School-01 and Helenabad Primary School-02. A total 405 students were included in the study from the two schools and they were from class III to Class V. The study showed that majority of students 61% were from Helenabad Primary

School-02 and 39% respondents were from Helenabad Primary School-01 (Figure no.1). The results about the quantity of students of these two schools indicated that the quality education is more in Helenabad Primary School-02 than Helenabad Primary School-01.

The study showed that the majority respondents 53% were female and 47% respondents were male. The male - female ratio was 1 : 1.12 (Figure- 2). Currently (2011 est.) male - female ratio of our country is 1.01:1 (1.01 male/female, Under 15 years).⁹

The study revealed that 35.3% students were in class III, 36.5% students were in class IV and 28.1% students were in class V (Table-II). Majority students (97.0%) belonged to the religion of Islam and 3.0% students were Hindu (Table -III). Currently 90% of our populations are Muslim⁹.

It showed that the majority (71.0%) students came from nuclear family. We also found from the survey that only 29.0% respondents belonged to the joint family (Table-IV). This study indicates that changes taking place in the structure of the family in our country. It is not a good sign of for country. Joint family or extended family can help the children to learn morality.

It was explored that the 56.3% students' fathers were service holder, 38.5% fathers were businessmen, and 5.2% were day labor (Table-V). Majority of the mothers (84.7%) were house wives. We also found that only 13.1% mothers' occupation were service and 2.2% mothers were day laborer (Table-VI). It showed that 22.0% respondent's monthly family income was less than Tk. 7500.00 considered as low income group (Table-VII). The result indicates that a good proportion of families still poor of Bangladesh community.

The study showed that 71.1% clean their teeth two times daily. It also showed that 19.5% students clean their teeth three times daily and 9.4% students clean their teeth once daily (Table-VIII). It also revealed that 64.4% students' clean teeth before breakfast, 14.3% students clean their teeth after any meal and 4.7% students clean their teeth after lunch. Only 16.5 students clean teeth before sleeping (Table-IX). About ninety six percent (96.5%) student used tooth paste for cleaning their teeth, 3.0% students used tooth powder and 2 students used meswak for cleaning their teeth (Table-X). It showed that 87.65% respondents mentioned the technique of teeth brushing is 'Horizontal scrub', 69.13% respondents brushing their teeth up and down and only 6.17% respondents used other technique for brushing their teeth (Table-XI). Although most of the students had their knowledge about healthy habits but a good proportion of students did not cleaning teeth properly. So they should be aware through health education program. In another study of the oral hygiene status of students in selected secondary school in Osogbo, Nigeria stated that 86.8% of the students had good oral hygiene, 12.1% have oral hygiene that could be said to be fair, while 1.2% had poor oral hygiene. Based on this result, one could conclude that these students' oral hygiene status was high. It also showed that oral hygiene was better among the female respondents than the male respondents¹⁰.

About 56% father occupation were service. Among them 12.7% students cleaned their teeth once in a day, 60.0% brushed two times in a day and 23.2% brush teeth three times in a day. This study revealed that the relationship between father's occupation and brushing teeth was statistically significant ($p < 0.05$). (Table-XII)

The frequency distribution of the study subjects by mother occupation and teeth brushing, it was showed that 13.1% mothers' occupation was service. Among them 7.5% students cleaned their teeth once in a day, 75.5% brushed two times in day and 17.0% brushed teeth three times in a day. 2.2% students' mothers were day labour.

Among them 88.9% students' cleaned teeth two times in a day and 11.1% brushed once in a day. It also showed that 84.7% respondent's mother were housewives. Among them 59.6% students brushed teeth once in a day, 70.0% brushed two times in a day and 20.4% brushed three times daily. The study also revealed that the relationship between mothers occupation and brushing teeth was not statistically significant ($p > 0.05$) (Table-XIII).

Conclusion:

The objective of the present study was to assess the level of practices of primary school going children about personal hygiene of Helenabad colony of Rajshahi city corporation Bangladesh and to find out the association between some selected socio-demographic factors and practice on personal hygiene of the school going children. A descriptive cross sectional study was carried out among the 405 school going children of class three to class five of study area.

The survey was carried out in the Helenabad primary school-01 and Helenabad primary school-02. The study revealed that 47% were male and 53% respondents were female respectively. The male - female ratio was 1: 1.12. Regarding distribution of students by class 35.3% students were in class III, 36.5% students were in class IV and 28.1% students were in class V. About age of the respondents majority (59.8%) belonged to the age group of 9 - 10 years. It was also found that 16.5% students were less than 9 years and 23.7% were 11 and above years. The mean age of the students was 9.65 ± 1.158 years.

It was found that majority of the mothers 84.7% were house wives. We also found that only 13% mothers' occupation were service and the relationship between the level of knowledge on hygiene and mothers occupation of the respondents was not statistically significant ($p > 0.05$). About 56% fathers occupation were service, 38.5% were business man and 5% were day laborer. The study showed that the relationship between knowledge and practice on personal hygiene father's occupation was statistically significant ($p < 0.05$).

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Clinical evaluation of Gluma and Fluocal as desensitizing agents in the treatment of dentin hypersensitivity

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Abstract:

Background: Previous studies have indicated that the effectiveness of desensitizing agents in reducing dentin hypersensitivity is mainly depending on the occlusion of dentinal tubules. However, their long term ability to occlude dentinal tubules is not clarified yet. **Objectives:** To compare the effect of Gluma and Fluocal as desensitizing agents in the treatment of dentin hypersensitivity. **Methods:** Thirty six healthy adult having bilateral gingival recession of both maxillary and mandibular teeth was selected for the study. The method of sampling was a purposive sampling. After clinical evaluation, 98 teeth were selected from 36 patients who fulfilled the inclusion criteria. These 98 samples were divided equally into two groups. Group 1: The right sided teeth were treated by Gluma and Group 2: The left sided teeth were treated by Fluocal. Each tooth was subjected to cold, tactile and osmotic stimulus to assess the level of sensitivity, recorded by the VAS score prior to treatment and baseline, 1, 3, 6, & 12 months after topical treatment. Statistical analysis was performed using Chi-square (χ^2) test. A value of $p < 0.05$ was considered as statistically significant. **Results:** The result of this present study showed that both agents are capable of reducing dentin hypersensitivity at baseline and 1 month follow up observation but Gluma was more effective than Fluocal against all the test stimuli at 3, 6, & 12 months observation period in respect of no sensitivity. The differences between two groups were statistically significant ($p < 0.05$). **Conclusion:** It can be concluded that Gluma desensitizer is more effective compared to that of Fluocal in relieving dentin hypersensitivity.

Key words: Dentin hypersensitivity, Gluma, Fluocal, Desensitizing agents.

(Bangladesh Dental Journal 2012; 28: 38-43)

Introduction:

Dentin hypersensitivity is a common complaint and is one of the most painful problems of teeth. It is defined as a short, sharp and well localized pain arising from exposed dentin in response to thermal, evaporative, tactile, osmotic or chemical stimuli which cannot be explained by any other dental defect or pathology¹. It is widely accepted that dentin hypersensitivity is an uncomfortable condition that also affects the function and quality of life.

There are many and varied etiological and predisposing factors related to dentin hypersensitivity. Exposed dentinal tubules either by loss of enamel due to attrition, abrasion and erosion or by loss of cementum due to gingival

recession is commonly cited². Brushing habits especially with harder bristled, dietary habit, Para functional habits, chewing tobacco and some diseases including gastro-esophageal reflux, acute and chronic gingival and periodontal diseases can also cause dentin hypersensitivity. It is a common side effect of tooth whitening procedure and removing calculus on the surface of the tooth by professionals³. Haywood stated that 55% to 75% of patients suffered from this whitening related sensitivity.

Another most common clinical cause of exposed dentinal tubules is gingival recession, because it causes exposure of root surface. Clinical studies have reported once gingival recession has exposed root surfaces, the cementum is rapidly lost from brushing with toothpaste and/or professional cleaning. It has also been reported that recession will increase over time with the use of hard-bristle brushes, excessive force and frequency of brushing. Frequency of gingival recession increases with age and is greater in men than in women⁴. The most common location of recession is the facial aspect of canines, premolars and molars. (The teeth most commonly affected are canines> premolars> incisors> molars⁵).

There are several theories for dentinal hypersensitivity, such as odontoblastic transduction theory, neural theory

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and hydrodynamic fluid theory. The most widely accepted theory for dentinal hypersensitivity is the hydrodynamic theory presented by Brannstrom and others which suggests that the fluids within the dentinal tubules flow due to thermal, mechanical, evaporative and osmotic stimuli. The flow of liquids in dentinal tubules can trigger nerves along the pulpal canal of dentin, causing pain. This hydrodynamic flow can be increased by hot, cold, sweet or sour beverages, cold air, aggressive flossing and brushing⁶.

There are two treatment options. These are plugging the dentinal tubules, preventing fluid flow and desensitizing the nerve, making it less responsive to stimulation. Several approaches and numerous agents have been investigated for treating dentinal hypersensitivity, including potassium nitrate, silver nitrate, zinc and strontium chloride, formaldehyde, gluteraldehyde, calcium hydroxide, sodium citrate, potassium oxalate, resin adhesives and fluorides³.

These cases must be managed efficiently, quickly and permanently. West in a recent review, it is conclusive that the evidence of successful treatment regimens of dentin hypersensitivity remains elusive, despite a multitude of products are available for treatment⁷. The efficacies of these products are varied, not well established and unpredictable. Therefore, clinicians are left to determine the most satisfactory and effective treatment approach for the relief of dentin hypersensitivity for patients in their practices⁸.

Two topical desensitizers were employed in this study. One is Gluma desensitizer; (Heraeus Kulzer, Germany) a non-fluoride product containing 5% gluteraldehyde and 35% hydroxyethyl methacrylate (HEMA) reduce dentinal hypersensitivity by occluding tubules possibly by precipitating plasma proteins in dentinal fluids. Another is Fluocal solute (Septodont, France) a fluoride containing product composed of 1% sodium fluoride reduce dentinal hypersensitivity by precipitating fluoride compounds and mechanically occlude the exposed dentinal tubules blocking the transmission of the stimuli.

Only a few studies evaluated the effectiveness of the desensitizing agents in vivo. Hence, it was considered that this study assess the efficacy of these desensitizing agents in providing relief from dentin hypersensitivity and help the clinician to choose the effective treatment solution for dentin hypersensitivity.

Materials and Methods:

Thirty six healthy adult individual having bilateral gingival recession of both maxillary and mandibular teeth was

selected for the study from outpatient department of conservative dentistry and endodontics, BSMMU. Data was collected and the written consent taken from the patient to assess the dentin hypersensitivity. A detailed medical and dental history was recorded. After clinical evaluation, 98 teeth were selected from 36 patients who fulfilled the inclusion criteria. The materials used in this study were Gluma desensitizer and Fluocal solute. These 98 samples were divided into two groups. Group 1: The right sided teeth were treated by Gluma and Group 2: The left sided teeth were treated by Fluocal. Sensitivity was assessed by means of cold, tactile and osmotic stimuli. All the stimuli were applied on the cervical region of the experimental teeth. The adjacent teeth were isolated with cotton rolls and a suction device was used to control saliva. Cold water of 9⁰ c temperature was filled in a 5 ml disposable syringe and applied at 0.5 cm distance to the cervical region of experimental tooth surface. Tactile stimulus was done by a sharp explorer with gentle pressure perpendicular to the long axis of the tooth and osmotic stimulus was done by glucose solution prepared with 25 gm glucose in 100 ml of water. The patients were given a VAS (Visual Analog Scale) upon which they asked to place a pencil mark at a point marked from 0 to 10 to describe the pain experienced. The extreme left side indicated zero pain and the extreme right, maximal pain. The sensitivity score was 1-3 (mild pain), 4-6 (moderate pain) and 7-9 (severe pain). Visual Analog Scale (VAS) is used to measure the pain score of human subjective states in clinical research but no other device to measure hypersensitivity. Both pain and sensitivity are expressed by the patient as an unpleasant sensation, so in this study VAS was used to measure the sensitivity level of study subjects.

The manufactures instructions were followed during the application of the materials. Prior to the application of desensitizing agents, the experimental teeth were dried and isolated with cotton rolls and a suction device. For Gluma desensitizer, two coatings were applied. First, a few drop of Gluma were applied with a micro brush using a gentle but firm rubbing motion. After 30 seconds, the area was dried with a damp cotton pellet until the fluid disappeared and the surface was not shiny. Another coating was applied in the same manner. Fluocal was also applied in two coatings using micro brush. It was applied for 1 minute and excess was removed with a cotton pellet. The baseline measurement of the dentin hypersensitivity was recorded by using a visual analog scale (VAS). All patients were recalled at 1, 3, 6 & 12 months and a new VAS analysis were conducted for assessment of their sensitivity level in each observation period.

Results:

In this present study, the sensitivity level of study teeth which was treated either by Gluma or Fluocal and then subjected to cold, tactile and osmotic stimulus were clinically evaluated at baseline, 1, 3, 6, and 12 months observation period by VAS score. The descriptive statistics of two groups are given in table 1, 2 and 3.

Data were expressed in number and percentage. Statistical analysis was done by Chi-square test. The test of significance was calculated and p values <0.05 was accepted as level of significance.

Table-I shows the comparison of sensitivity level of the study teeth by cold stimulus between Gluma and Fluocal groups following each observation period. It was observed that at baseline and after 1 month follow up observation between two groups the differences were not statistically significant ($p > 0.05$). But after 3, 6 and 12 months follow up in respect of no sensitivity the differences between two groups were statistically significant ($p < 0.05$). Moderate sensitivity at 6 & 12 months and severe sensitivity at 12 months follow up also statistically significant.

Table-I
Comparison of sensitivity level (VAS score) between two groups by cold stimulus (n=98 teeth)

| Sensitivity level (VAS score) by cold stimulus | Group 1 Gluma desensitizer (n=49 teeth) | | Group 2 Fluocal (n=49 teeth) | | P value |
|--|---|-------|------------------------------------|-------|------------|
| | No. | % | No. | % | |
| Baseline | | | | | |
| No sensitivity | 33 | 67.3% | 30 | 61.2% | P = 0.522 |
| Mild sensitivity | 10 | 20.4% | 8 | 16.3% | P = 0.601 |
| Moderate sensitivity | 4 | 8.2% | 7 | 14.3% | P = 0.299 |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 1 month | | | | | |
| No sensitivity | 33 | 67.3% | 30 | 61.2% | P = 0.522 |
| Mild sensitivity | 10 | 20.4% | 8 | 16.3% | P = 0.601 |
| Moderate sensitivity | 4 | 8.2% | 7 | 14.3% | P = 0.299 |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 3 months | | | | | |
| No sensitivity | 39 | 79.6% | 28 | 57.1% | P = 0.016* |
| Mild sensitivity | 6 | 12.2% | 10 | 20.4% | P = 0.274 |
| Moderate sensitivity | 2 | 4.1% | 7 | 14.3% | P = 0.080 |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 6 months | | | | | |
| No sensitivity | 40 | 81.6% | 24 | 49.0% | P = 0.001* |
| Mild sensitivity | 5 | 10.2% | 7 | 14.3% | P = 0.538 |
| Moderate sensitivity | 2 | 4.1% | 13 | 26.5% | P = 0.002* |
| Severe sensitivity | 2 | 4.1% | 5 | 10.2% | P = 0.239 |
| After 12 months | | | | | |
| No sensitivity | 40 | 81.6% | 21 | 42.9% | P = 0.002* |
| Mild sensitivity | 5 | 10.2% | 6 | 12.2% | P = 0.751 |
| Moderate sensitivity | 2 | 4.1% | 13 | 26.5% | P = 0.002* |
| Severe sensitivity | 2 | 4.1% | 9 | 18.4% | P = 0.025* |

n = number of samples

* = statistically significant ($P < 0.05$)

Data were expressed in number and percentage. Statistical analysis was done by Chi-square test. The test of significance was calculated and p values <0.05 was accepted as level of significance.

Table-II shows the comparison of sensitivity level of the study teeth by tactile stimulus between Gluma and Fluocal groups following each observation period. It was observed that at baseline and after 1 month follow up observation between two groups the differences were not statistically significant ($p > 0.05$). But after 3, 6 and 12 months follow up in respect of no sensitivity and moderate sensitivity the differences between two groups were statistically significant ($p < 0.05$). Severe sensitivity at 12 months follow up also statistically significant.

Data were expressed in number and percentage. Statistical analysis was done by Chi-square test. The test of significance was calculated and p values <0.05 was accepted as level of significance.

Table-III shows the comparison of sensitivity level of the study teeth by osmotic stimulus between Gluma and Fluocal groups following each observation period. It was observed that at baseline and after 1 month follow up observation between two groups the differences were not statistically significant ($p > 0.05$). But after 3, 6 and 12 months follow up in respect of no sensitivity the differences between two groups were statistically significant ($p < 0.05$). Moderate sensitivity at 6 & 12 months and severe sensitivity at 12 months follow up also statistically significant.

Table-II

Comparison of sensitivity level (VAS score) between two groups by tactile stimulus (n=98 teeth)

| Sensitivity level (VAS score) by tactile stimulus | Group 1 | | Group 2 | | P value |
|---|------------------------------------|-------|-------------------------|-------|------------|
| | Gluma desensitizer (n=49 teeth) | | Fluocal (n=49 teeth) | | |
| | No. | % | No. | % | |
| Baseline | | | | | |
| No sensitivity | 33 | 67.3% | 30 | 61.2% | P = 0.522 |
| Mild sensitivity | 12 | 24.5% | 10 | 20.4% | P = 0.336 |
| Moderate sensitivity | 2 | 4.1% | 7 | 14.3% | P = 0.080 |
| Severe sensitivity | 2 | 4.1% | 2 | 4.1% | P = 1.00 |
| After 1 month | | | | | |
| No sensitivity | 33 | 67.3% | 30 | 61.2% | P = 0.522 |
| Mild sensitivity | 11 | 22.4% | 10 | 20.4% | P = 0.296 |
| Moderate sensitivity | 3 | 6.1% | 7 | 14.3% | P = 0.090 |
| Severe sensitivity | 2 | 4.1% | 2 | 6.1% | P = 1.00 |
| After 3 months | | | | | |
| No sensitivity | 37 | 75.5% | 24 | 49.0% | P = 0.002* |
| Mild sensitivity | 7 | 14.3% | 8 | 16.3% | P = 0.777 |
| Moderate sensitivity | 3 | 6.1% | 15 | 30.6% | P = 0.001* |
| Severe sensitivity | 2 | 4.1% | 2 | 4.1% | P = 1.00 |
| After 6 months | | | | | |
| No sensitivity | 40 | 81.6% | 21 | 42.9% | P = 0.002* |
| Mild sensitivity | 5 | 10.2% | 8 | 16.3% | P = 0.371 |
| Moderate sensitivity | 2 | 4.1% | 15 | 34.7% | P = 0.000* |
| Severe sensitivity | 2 | 4.1% | 5 | 6.1% | P = 0.239 |
| After 12 months | | | | | |
| No sensitivity | 40 | 81.6% | 20 | 40.8% | P = 0.000* |
| Mild sensitivity | 5 | 10.2% | 7 | 14.3% | P = 0.538 |
| Moderate sensitivity | 2 | 4.1% | 13 | 26.5% | P = 0.002* |
| Severe sensitivity | 2 | 4.1% | 9 | 18.4% | P = 0.025* |

n= number of samples

* = Statistically significant ($p < 0.05$).

Table-III
Comparison of sensitivity level (VAS score) between two groups by osmotic stimulus (n=98 teeth)

| Sensitivity level (VAS score) by osmotic stimulus | Group 1 | | Group 2 | | P value |
|---|------------------------------------|-------|-------------------------|-------|------------|
| | Gluma desensitizer (n=49 teeth) | | Fluocal (n=49 teeth) | | |
| | No. | % | No. | % | |
| Baseline | | | | | |
| No sensitivity | 33 | 67.3% | 30 | 61.2% | P = 0.522 |
| Mild sensitivity | 12 | 24.5% | 8 | 16.3% | P = 0.431 |
| Moderate sensitivity | 2 | 4.1% | 7 | 14.3% | P = 0.080 |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 1 month | | | | | |
| No sensitivity | 33 | 67.3% | 30 | 61.2% | P = 0.522 |
| Mild sensitivity | 12 | 24.5% | 8 | 16.3% | P = 0.431 |
| Moderate sensitivity | 2 | 4.1% | 7 | 14.3% | P = 0.080 |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 3 months | | | | | |
| No sensitivity | 40 | 81.6% | 30 | 61.2% | P = 0.000* |
| Mild sensitivity | 5 | 10.2% | 8 | 16.3% | P = 0.371 |
| Moderate sensitivity | 2 | 4.1% | 7 | 14.3% | P = 0.080 |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 6 months | | | | | |
| No sensitivity | 42 | 85.7% | 21 | 42.9% | P = 0.000* |
| Mild sensitivity | 3 | 6.1% | 9 | 18.4% | P = 0.064 |
| Moderate sensitivity | 2 | 4.1% | 15 | 30.6% | P = 0.000* |
| Severe sensitivity | 2 | 4.1% | 4 | 8.2% | P = 0.400 |
| After 12 months | | | | | |
| No sensitivity | 42 | 85.7% | 20 | 40.8% | p = 0.000* |
| Mild sensitivity | 3 | 6.1% | 5 | 10.2% | p = 0.538 |
| Moderate sensitivity | 2 | 4.1% | 15 | 30.6% | p = 0.000* |
| Severe sensitivity | 2 | 4.1% | 9 | 18.4% | p = 0.025* |

n= number of samples

* = Statistically significant (p < 0.05).

Discussion:

In this present study, it was found that Gluma desensitizer and Fluocal were capable of reducing dentin hypersensitivity at the baseline and after 1 month follow up observation; there were no statistically significant differences found between the two groups. However, at 3, 6 & 12 months observation period, significant differences were found between Gluma and Fluocal against all the testing stimuli in respect of no sensitivity. The numbers of sensitivity less tooth in Gluma was increased until the end of the study. On the other hand, the number of sensitivity less tooth was decreased after 6 and 12 months observation period regarding Fluocal.

In this present study, the effectiveness of the Gluma and Fluocal in reducing dentin hypersensitivity was evaluated

with VAS, which is widely used in human clinical research to assess subjective states. It is based on a 10 mm scale; the extreme left side indicated zero point and the extreme right, indicated maximal pain. Research subjects are asked to indicate their response by marking a position on the line between the two extremes⁹.

Previous in vitro and in vivo studies have indicated that dentin hypersensitivity could be reduced following application of desensitizing agents. However, their long term effectiveness is still controversial. Therefore, evaluation of sensitivity by comparing between Gluma and Fluocal was the prime focus of this study.

The results found in this study were consistent with some of the previous studies. Dondi dall'Orologio et al. found

single topical treatments of hypersensitive teeth with Gluma desensitizer eliminated or at least significantly reduced dentin sensitivity throughout the 6 month observation time. The glutaraldehyde-based agent (Gluma) was proven more efficient in treating cervical dentin hypersensitivity up to the 9-month follow up¹⁰.

The mechanism of reducing sensitivity in Gluma is not clarified in this present study. But according to previous study, it can be stated that as Gluma desensitizer product contains 5% glutaraldehyde and 35% hydroxyethyl methacrylate (HEMA), which is capable to immediate occlusion of the dentinal tubules. The reason for immediate occlusion of the dentinal tubules is an effect of glutaraldehyde on the proteins of the dentinal tubules. In the reaction of glutaraldehyde with dentin, the two groups of aldehyde (present in glutaraldehyde) interlace themselves with the amino groups of dentin collagen, leading to fixing proteins forming a barrier and polymerization of HEMA leaving a thin films of polymerized material on the dentin surface. The positive result of Gluma desensitizer presented in this study is in agreement with the literature¹⁰. Furthermore, the highly significant decrease the sensitivity score in Gluma may be due to glutaraldehyde because it kills the bacteria and coagulates plasma protein within the dentinal fluids, forming a coagulation plug³.

On the other hand, the present study revealed that Fluocal is also capable of reducing dentin hypersensitivity at baseline and 1 month observation period. However, its effectiveness is reduced following elapse of time. The results were consistent with other literature who evaluated the effectiveness of four topical desensitizing agents (Gluma, Duraphat, 2% fluoride iontophoresis, copal varnish) in providing short term relief of dentin hypersensitivity. The results found that, all agents caused a statistically significant reduction in dentin hypersensitivity within 24 hours of treatment. These findings are consistent with the result of prevailing study. The authors of the current study also found Gluma to be the most effective agents without significant difference with others at baseline but its long term effect has a significant difference with other materials. This is also confirmed by Ritter AV, Dias WL, et al. (2006).

The mechanism of Fluocal in reducing dentin hypersensitivity as well as the reason of short term relief¹¹. Fluocal contains 1% NaF, which helps in remineralization and reacts chemically with the calcium and phosphate ions providing a precipitation of CaF₂ crystals within the dentinal tubules and reduces the sensitivity by occluding the tubules. Though this crystal acts as a reservoir for releasing fluoride but it is an unstable compound. So, it

dissociates gradually after application and its effect is of short duration.

Therefore, based on the present study and together with the previous studies, it can be considered that Gluma reduce dentin hypersensitivity more effectively than that of Fluocal.

It should be considered that the evaluation of treatments for dentin hypersensitivity is not a simple procedure due to the natural desensitization of dentin, the mechanical occlusion of the dentinal tubules by secondary dentin and pain may be changes by subject's emotional component. Though this study represents Gluma desensitizer provides long term reduction of dentin hypersensitivity but multiple studies should be conducted to investigate the real benefits of this material before recommending their routine application in dentistry.

Conclusion:

It can be concluded that in respect to long term reducing of dentin hypersensitivity, Gluma is more effective than that of Fluocal.

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Oral Health Status of diabetic adult patients in selected tertiary level hospital

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Abstract:

This was a descriptive type of cross-sectional study on oral health status of diabetic adult patient in tertiary level hospitals. The study was conducted among diabetic patients of BIRDEM Hospital. Data were collected by semi-structured questionnaire and clinical examination. Oral examination were recorded by fill up the WHO oral health assessment form about dentition status and periodontal status. Oral health status was assessed by DMFT index (Decayed, Missing, Filled Teeth) to measure dental caries and periodontal index to measure gingival bleeding and periodontitis. Total 100 respondents were selected randomly for the study, This study found that among the diabetic patients majority of the respondents were housewife 68.0% and 13.0% of the respondents were service holder while very few of the respondents 5% were unemployed and 6% businessman. Regarding this study among the diabetic patients more than one third of the respondent's education level was primary passed 34.0% and 30.0% were illiterate while 15.0% and 11.0% were SSC and HSC passed respectively. Education of the respondents was significantly associated with diabetes status of the patient ($p < 0.001$, $\chi^2 = 24.479$).

Study shows among the respondents who were diabetic patient, maximum of the respondents were suffering from diabetes for more than 5 years and one third of the respondents were suffering from diabetes for more than 1 year and 13.0% of the respondents were suffering from diabetes for less than 1 year. One fourth of the respondents used injectable medicine 25.0% and 43.0% of the respondents used tablet while 31.0% of the respondents used both tablet and injectable medicine. Here 53.0% of diabetic patient had dental caries, 29.0% of the patient had gingivitis, 60.0% periodontitis, 40.7% of the had 4 to 5 mm periodontal attachment loss while only 2.9% of the them had 6 mm or more periodontal attachment loss. Missing teeth in diabetic patient was 47.0%. It is necessary to make the health professionals and the patients aware of the magnitude of problem and chalk out proper preventive procedures.

(Bangladesh Dental Journal 2012; 28: 44-48)

Introduction:

Diabetes mellitus is a silent epidemic which affects large number of people around the world and is directly related to the oral health status of the patients. It is the most common endocrine disorder or metabolic diseases characterized by elevated blood glucose levels (hyperglycemia) resulting from defects in insulin secretion, insulin action or both. According to the (WHO), at least 220 million people or 2.8% of the population worldwide

suffer from diabetes. Its incidence is increasing rapidly, and is estimated that by the year 2030, this number will almost double. The greatest increase in prevalence is expected to occur in Asia and Africa. The increase in incidence of diabetes in developing countries follows the trend of urbanization and lifestyle changes (Wild et al, 2004). Diabetes can lead to changes in the oral cavity such as gum-related problems like gingival hyperplasia and periodontitis, dental decay, candidiasis. Some individuals notice a fruity (acetone) breathe and others report xerostomia (Chi et al 2010; hatch 1989).

Diabetes mellitus is the most common endocrine disorder. It is the result of a malfunction of insulin-dependent glucose and lipid metabolism (Loe 1993; grossi 2001.)

There are two major forms of diabetes mellitus:

- Type 1, which is caused by the destruction of pancreatic beta cells that produce insulin.
- Type 2, in which target tissues do not respond to insulin.

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Type 1 diabetes is considered an absolute deficiency of insulin and is commonly diagnosed at a young age. Type 2 diabetes is associated with insulin resistance and deficiency both, and is commonly diagnosed later in life.

Individuals with diabetes are more likely than non-diabetics to develop gingivitis and periodontal disease. (NEng J Med 2000, McKenna 2006, Southerland et al 2006, AAP 2006.) This holds true for both type 1 and type 2 diabetes (Loe 1993.)

Periodontal disease has been identified as a major complication of diabetes, along with cardiopathy, nephropathy, neuropathy, retinopathy and loss of distal extremities (Li et al 2000, hugoson et al 1989.) An increased level of glucose in the blood, along with the metabolic products of glucose, is thought to contribute to these complications (Thorstensson et al 1993, Emrich et al 1991).

Periodontal disease results from an immune response of an individual to chronic infection of gram-negative bacteria, which leads to the destruction of the periodontal tissues, including the gingiva, periodontal ligament and alveolar bone (sastrowijoto et al 1990). Risk factors for periodontal disease include the presence of specific subgingival microorganisms, smoking and diabetes mellitus (NEng J Med 2000)

The oral complications of uncontrolled diabetes mellitus are devastating. These may include, but are not necessarily limited to, gingivitis and periodontal disease; xerostomia and salivary gland dysfunction; increased susceptibility to bacterial, viral and fungal (that is, oral candidacies) infections; caries; periapical abscesses; loss of teeth; impaired ability to wear dental prostheses (related in part to salivary dysfunction); taste impairment; lichen planus; and burning mouth syndrome (Vernillo 2001).

Unfortunately, caring for the oral cavity is often overlooked when trying to control other problems associated with diabetes which may contribute to hidden morbidity and undue suffering from oral health problems.

1.1 Rational of the study:

Diabetes mellitus affects people of all ages, and its prevalence has been increasing. Providing safe and effective oral medical care for patients with diabetes requires an understanding of the disease and familiarity with its oral manifestations.

It will enhance to quality of health-care delivery, improve patient outcomes, and serve as an impetus for medical

and dental care professionals to coordinate and collaborate towards the goal of improving the health of individuals with diabetes. This study will open venues of different aspect of dental diseases among diabetic patients and will help for further studies in the field to explore the determinants and predictions of dental health problems among diabetes mellitus patients.

1.2 Objectives:

General Objective:

To find out the oral health status of diabetic adult patients in BIRDEM Hospital.

Specific objectives –

- i) To assess the oral health status of diabetic patients.
- ii) To find out the oral hygiene practice of the study population.
- iii) To find out the food habit of the study population.
- iv) To determine the socio-demographic and socio-economic status of the study population.

2.0 Materials and Methods :

This study was a descriptive type of cross-sectional study. The study was carried out at Dental outpatient department (OPD) of BIRDEM hospital Dhaka. Diabetic patients selected by Convenient random sampling over a period of one year starting from January 2014 to December 2014.

2.1 Data collection technique

Face to face interview

Clinical Oral Examination

2.2 Data Collection tools

The questionnaire was prepared on English and Bengali that was based on the socio-demographic characteristics, oral habit and oral hygiene practice of study population. Recording oral examination and fill up the oral health assessment form about- Dentition status- Decayed, Missing, Filled Teeth to measure dental caries status, Periodontal status- Modified CPI Index (Community Periodontal Index) to measure periodontal disease.

2.3 Data Collection:

Attending adult patients were at first check by departmental dental surgeon and giving his medication, I took verbal consent from the patients. After taking verbal consent of the patients, I filled up the questionnaire that was based on socio-demographic characteristics, oral habit and oral hygiene practice. Then I recorded oral health

status of the patients according to WHO proforma. The examination was done using artificial light with a mouth mirror and periodontal probe.

2.4 Data Analysis:

After collection of data, all data was verified. Finally data was analyzed by using statistical package for social science (SPSS) program. (Version-19)

3 Result:

This study was carried out to find out oral health status of diabetic adult patient in selected tertiary level hospitals. 100 was diabetic patients were selected for the study. Data were collected by semi structured questionnaire. Findings of the study are presented by graphs and tables.

3.1 Socio-demographic characteristics of the respondents

Table-I
Distribution of respondents according to age

| Age | Diabetic | |
|--------------------|------------|--------------|
| | Number | % |
| 30 years and below | 6 | 6.0 |
| 31 to 40 years | 21 | 21.0 |
| 41 – 50 years | 36 | 36.0 |
| Above 50 years | 37 | 37.0 |
| Total | 100 | 100.0 |

The age of the respondents ranged between 18 and 70 years with a mean of 40.55 ± 13.285 years. Table-I proportion of diabetic patient’s age was highest among above 50 years age group and lowest was among 30 years and below while 36.0% and 21.0% respondent’s age was among 41 to 50 years and 31 to 40 years age group.

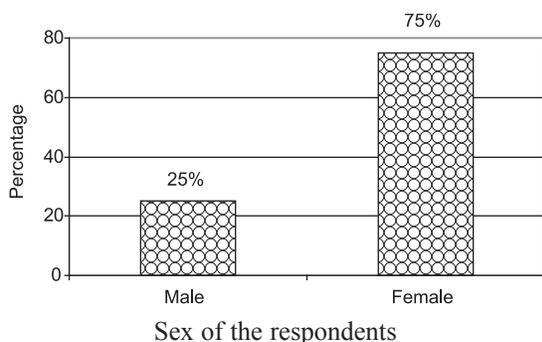


Fig-1: *Distribution of respondents by sex*

Among the patients 25.0% were male and 75.0% were female.

Table-II
Socio-demographic characteristics of the respondents

| Socio-demographic characteristics | Diabetic | |
|-----------------------------------|------------|--------------|
| | Number | % |
| Marital status | | |
| Married | 98 | 98.0 |
| Unmarried | 1 | 1.0 |
| Divorced | 1 | 1.0 |
| Total | 100 | 100.0 |
| Occupation | | |
| Service | 13 | 13.0 |
| Unemployed | 5 | 5.0 |
| Business man | 6 | 6.0 |
| Student | 3 | 3.0 |
| Housewife | 68 | 68.0 |
| Day laborer | 5 | 5.0 |
| Total | 100 | 100.0 |

$p < 0.001, \chi^2 = 36.650$

Education

| | | |
|--------------|------------|--------------|
| Illiterate | 30 | 30.0 |
| Primary | 34 | 34.0 |
| SSC | 15 | 15.0 |
| HSC | 11 | 11.0 |
| Honors | 10 | 10.0 |
| Total | 100 | 100.0 |

$p < 0.001, \chi^2 = 24.479$

Among the diabetic patients most of the respondents were married (98.0%) and only 1.0% of the respondents were divorced and unmarried. Among the patients majority of the respondents were housewife (68.0%) and 13.0% of the respondents were service holder while very few of the respondents were unemployed and businessman. (22.0%) Occupation of the respondents was significantly associated with diabetes status of the patient ($p < 0.001$). Among the diabetic patients more than one third of the respondents education level was primary passed (34.0%) and 30.0% were illiterate while 15.0% and 11.0% were SSC and HSC passed respectively. Education of the respondents was significantly associated with diabetes status of the patient ($p < 0.001$)

Table-III
Information related to diabetes (n=100)

| Characteristics | Number | % |
|-----------------------------------|--------|------|
| Duration of diabetes | | |
| Less than 1 year | 13 | 13.0 |
| More than 1 years | 33 | 33.0 |
| More than 5 years | 54 | 54.0 |
| Medicine used for diabetes | | |
| Tablet | 43 | 43.0 |
| Injection | 25 | 25.0 |
| Both | 31 | 31.0 |
| None | 1 | 1.0 |

Study shows among the respondents who were diabetic patient, maximum of the respondents were suffering from diabetes for more than 5 years and one third of the respondents were suffering from diabetes for more than 1 year and 13.0% of the respondents were suffering from diabetes for less than 1 year. One fourth of the respondents used injectable medicine 25.0% and 43.0% of the respondents used tablet while 31.0% of the respondents used both tablet and injectable medicine.

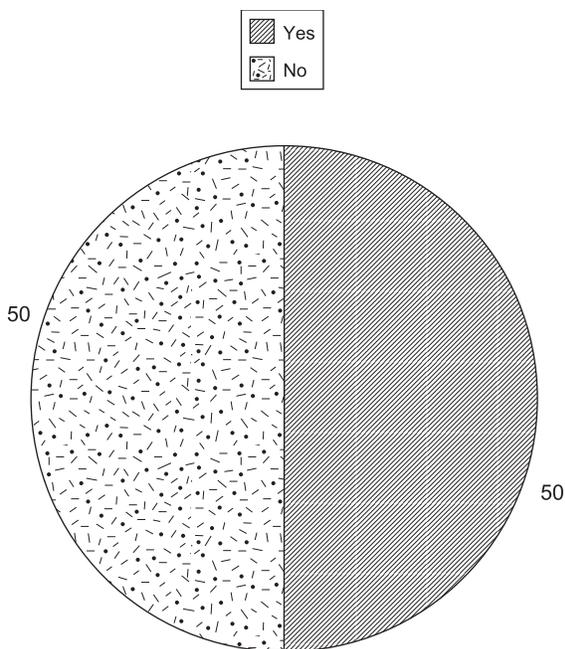


Fig.-2: *Distribution of respondents by insulin use*

Figure shows half of the respondents 50% among diabetic patient used insulin & half of the respondents 50% did not take insulin.

Table-IV
Distribution of respondents by family history of diabetes

| Family history of diabetes | Number | % |
|----------------------------|--------|-------|
| Yes | 59 | 59.0 |
| No | 41 | 41.0 |
| Total | 100 | 100.0 |

Among the diabetic patient 59.0% of the respondents had family history of diabetes and 41.0% had no family history of diabetes (Table-IV)

Table-V
Distribution of diabetic respondents by other diseases

| Other Diseases | Number | % |
|----------------|--------|-------|
| Heart disease | 15 | 15.0 |
| Kidney disease | 3 | 3.0 |
| Hypertension | 18 | 18.0 |
| Oral ulcer | 7 | 7.0 |
| Others | 38 | 38.0 |
| No disease | 19 | 19.0 |
| Total | 100 | 100.0 |

Regarding this study among the diabetic patients 15.0% and 18.0% of the respondents had heart disease and hypertension and 38.0% of the respondents had other disease than mentioned while 19.0% of the respondents had no disease (Table-V).

Table-VI
Distribution of respondents by frequency of oral hygiene practice

| Frequency of oral hygiene practice | Diabetic | |
|------------------------------------|----------|------------|
| | Number | Percentage |
| Once | 38 | 38.0 |
| Twice | 58 | 58.0 |
| More than twice | 4 | 4.0 |
| Total | 100 | 100.0 |

$p=0.105, \chi^2=4.560$

Study shows all of the patients cleaned mouth regularly. Among the diabetic patients maximum of the respondents cleaned their mouth twice daily 58.0% and 38.0% of the respondents cleaned their mouth once daily while only 4.0% of them cleaned their mouth more than twice daily. Frequency of mouth clean was not significantly associated with diabetic status of the patient ($p=0.105$)

Table-VII

Caries, Missing, Gingivitis, Periodontitis presence in the diabetic subjects

| | Absent | Present |
|---------------|---------|---------|
| Caries | 4747.0% | 5353.0% |
| Missing | 5353.0% | 4747.0% |
| Gingivitis | 7171.0% | 2929.0% |
| Periodontitis | 3940.0% | 6160.0% |

In this study 53.0% of diabetic patient had dental caries, 29.0% of the patient had gingivitis, 60.0% periodontitis.

Conclusion:

Diabetes mellitus is one of the most dreaded and silent epidemic health problems, especially in the developing countries. But, very few health professionals and patients have an idea of the implications of diabetes on oral health. This contributes to an ever increasing burden of underlying, undiagnosed, and untreated morbidity in the community.

Here 53.0% of diabetic patient had dental caries, 29.0% of the patient had gingivitis, 60.0% periodontitis, 40.7% of the had 4 to 5 mm periodontal attachment loss while only 2.9% of the them had 6 mm or more periodontal attachment loss. Missing teeth in diabetic patient was 47.0%. It is necessary to make the health professionals and the patients aware of the magnitude of problem and chalk out proper preventive procedures.

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Aesthetic and functional rehabilitation with flexible removable partial denture: A case report

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Abstract:

Replacement of missing tooth is very essential for aesthetic and functional rehabilitation. Conventional fixed partial dentures, implant supported Fixed Partial Dentures (FDPs) and removable partial dentures are the most common treatment options for the partially edentulous patients. Hard and soft tissue undercuts are frequently encountered in the fabrication of prosthesis in partially as well as completely edentulous arches. Innovation of flexible dentures, flexibility combined with strength, specially in undercut areas and light weight provides total comfort and great looks. Features of these prostheses are good retention, aesthetically superb and virtually invisible, excellent strength, easy in handling, no involvement of metal, noninvasive procedures, comfort. All of these factors become important when producing long-term prostheses. So, when patient is concerned about aesthetics, flexible partial dentures which is aesthetically superior to flipper and cast partial dentures, may be considered. This article is an effort to review the available flexible denture base materials and highlights their indications and special instructions in wearing and maintenance.

Key words: Flexible Denture, Removable Partial Denture (RPD), Undercuts, Prosthesis, Denture Base.

(*Bangladesh Dental Journal 2012; 28: 49-53*)

Introduction:

Conventional fixed partial dentures, implant supported Fixed Partial Dentures (FDPs) and removable partial dentures are the most common treatment modalities for the aesthetic and functional rehabilitation of partially edentulous patients. Unilateral or bilateral undercuts are frequently encountered and may complicate successful fabrication of denture prosthesis. Management of these situations conventionally includes alteration of the denture prosthesis bearing area, adaptation of the denture base, careful planning of the path of insertion and the use of resilient lining material. There are several types of RPD's.^{1,2}

All of them use standard denture teeth as replacements for the missing natural teeth.¹ The differences between them are the materials used to support the denture teeth and retain the RPD in the mouth.^{1,3} An alternative denture prosthesis design in which optimal flange height and thickness can be achieved is by using flexible denture base material. The application of nylon-like materials to the fabrication of dental appliances has been seen as an advance in dentistry.¹ This material generally replaces the metal, and the pink acrylic denture material used to build the framework for standard RPD's.^{1,4}

Thermoplastic materials for dental prostheses, Valplast (Valplast Int. Corp.-USA) and Flexiplast (Bredent - Germany), were first introduced to dentistry in the 1950s.¹ Both materials were similar grades of polyamides (nylon plastics). Since their introduction, there has been a continued interest in thermoplastic dental materials.^{1,5,6} Acetal was first proposed as an unbreakable thermoplastic resin RPD material in 1971. It was during this period that Rapid Injection Systems developed the first tooth-colored clasps with a thermoplastic fluoropolymer.⁷ In 1992 The Flexite Company developed and patented the first preformed tooth-color clasps known as Clasps-Eze. This product, made of a nylon material, is available in pink and clear color shades and currently sold worldwide.¹ Thermoplastic resins are used for a broad variety of applications from removable flexible partial dentures preformed partial denture clasps, fiber reinforced fixed

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partial dentures, provisional crowns and bridges, obturators and speech therapy appliances, orthodontic retainers and brackets, impression tray⁸ and border molding materials⁹, occlusal splints, sleep apnea appliances, and implant abutments. Flexible materials (thermoplastic resins and co-polymers) have many advantages over conventional resin systems.¹ A flexible material is now an option that does not trade off the ability to eat.¹⁰

Flexible Dentures

Soft dentures are generally used when traditional dentures cause discomfort to the patient that cannot be solved through relining. Soft dentures are not the same as a soft relined for traditional dentures. Soft relines use a soft putty-like substance to separate gums from the hard acrylic in dentures. Flexible dentures use a special flexible resin that prevents them from chafing the gums, allows the wearer to chew properly. It also provides a soft base that prevents the gums from being rubbed. Some of the commercially available products are Valplast, Sunflex, Duraflex, Flexite, Proflex, Lucitone, Impak where as valplast, Sunflex and lucitone are monomer free.

Advantages of flexible dentures

Flexible dentures have got various advantages over the traditional rigid denture bases.

- Translucency of the material picks up underlying tissue tones, making it almost impossible to detect in the mouth.
- No clasping is visible on tooth surfaces (when used in manufacturing of clear clasps), improving aesthetics.
- The material is exceptionally strong and flexible. Free movement is allowed by the overall flexibility.
- Complete biocompatibility is achieved because the material is free of monomer and metal, these being the principle causes of allergic reactions in conventional denture materials.
- Clinicians are able to use areas of the ridge that would not be possible with conventional denture and partial techniques. Patient can wear appliances that would normally not be comfortable.
- Flexible dentures will not cause sore spots due to negative reaction to acrylic resins and will absorb small amounts of water to make the denture more soft tissue compatible.

- Flexible dentures may be used as an alternate treatment plan in rehabilitating the anomalies such as ectodermal dysplasia.

Disadvantages of flexible dentures

- Flexible dentures generally not used for long term restorations and is intended only for provisional or temporary applications.
- Flexible dentures tend to absorb the water content and will discolor often.
- Metal frame partial dentures remain the "standard" for long-term restorations.
- When grinding this prosthesis, proper ventilation, masks and vacuum systems should be used and the procedure is technique sensitive.
- Extreme caution is necessary when processing to avoid skin contact with the heated sleeve, cartridge, furnace, heating bay, hot cartridge, injection insert, piston head adapter, hot flasks, and heat lamps.

Indications of flexible dentures

- As a provisional in lieu of restorative temporaries or a standard acrylic partial.
- As obturators with maxillectomy procedures.
- In single denture cases.
- The patient prefers not to use a fixed restoration.
- In challenging cases including pediatric patients, cancerous mouths or cleft palates.
- Cosmetic veneers to mask gingival recession, splints and nesbits.
- When protuberant bony formations restrict the insertion of an acrylic full denture.
- When the patient is allergic to acrylic.
- A patient with systemic sclerosis and microstomia.

Contraindications of flexible dentures

- The fabrication of flexible partial dentures is contraindicated in patients with insufficient interarch space (< 4mm space for placement of teeth), prominent residual.
- Ridges where there is less space for placement of teeth.
- Flat flabby ridges with poor soft tissue support which require more rigid prosthesis.

Case Report:

A 48 years old female patient reported in the Department of Prosthodontics, with a chief complaint of multiple missing teeth. The patient presented with partially edentulous arches with bilaterally missing posterior teeth in maxilla (Kennedy class I) and missing both anterior and posterior teeth in mandible (Kennedy class II Modification II), as shown in Fig.-1. Some of the remaining teeth had carious lesions, cervical abrasions and carious exposures. Carious and cervically abraded teeth were restored and root canal treatment of carious, exposed teeth was done. Flexible partial denture was fabricated for replacing maxillary posterior teeth, because clasps placed on Lateral incisor in upper jaw with flexible material are aesthetically good and more retentive because of their extensions into undercuts which present lateral to maxillary tuberosity, and in mandible for better retention with easy insertion in the mouth.



Fig.-1: Missing teeth in Upper and Lower Jaw



Fig.-2: Alignment of teeth in Articulator



Fig.-3: Fabricated Flexible Upper Denture



Fig.-4: Fabricated Lower Flexible Denture



Fig.-5: Upper & Lower Flexible Denture in Mouth

Procedure

- o Diagnostic casts were prepared using alginate impressions.
- o Cast were mounted on surveyor and were analyzed on the basis of present undercut.

- o The diagnostic casts were articulated (semi adjustable articulator) using centric relation record and face bow transfer to evaluate inter arch space.
- o Final Impressions were made using polyvinyl siloxane light body material of both the arches.
- o In case of distal extensions cases Primary impressions were made with alginate and primary casts were made and special tray prepared with self cure acrylic resin. Definitive impressions were made using custom trays border moulding was done with low fusing compound and final impressions were made using polyvinylsiloxane light body material.
- o Final casts were made with Type III dental stone.
- o Maxillomandibular relationships were recorded with check bite method.
- o Definitive casts were mounted on semi adjustable articulator.
- o Shade selection was done and artificial acrylic resin teeth were arranged.
- o Dentures were tried in patient's mouth and after approval by patient dentures were processed in injection system.
- o Dentures were finished, polished and inserted. Occlusion was evaluated and adjusted.
- o Postoperative instructions on how to insert the prostheses and with instruction on adequate oral hygiene maintenance.

Discussion:

Removable partial denture is commonly used for treating the patients who are not good candidates for conventional fixed partial dentures and implant supported prosthesis. These prostheses can be fabricated from metal alloy, acrylic resin and thermoplastic resins. The removable cast partial denture is a definitive prosthesis which has been in use in dental professions since decades for rehabilitation of partially edentulous patients. It consists of a metal base (made up of base metal alloys, commonly with cobalt-chromium alloy), with acrylic teeth attached to it. Metal retentive clasp holds the cast partial denture in place. The metallic appearances of the clasp may be restrictive, treating the patient who are very much concerned about the aesthetics. When maxillary posterior teeth are missing and only anterior teeth are present, placement of metallic clasps on canines may not be acceptable to few patients.¹¹ The second type of removable partial denture is all acrylic resin prosthesis, which is also known as temporary, interim

removable partial denture or a "FLIPPER". It acts as a space maintainer and is usually used to restore the function during the treatment until the definitive prosthesis is fabricated. Flexible denture material is available in the form of granules in cartridges of varying sizes. It was first introduced by the name of valplast and flexiplast to dentistry in 1956. These are superpolyamides which belong to nylon family. Nylon is a resin derived from dicarboxylic acid, diamine, amino acid and lactams. Injection-molding technique is used for fabrication of flexible denture base prosthesis. The prosthesis fabricated from these materials requires minimum /no mouth preparation, it provides a good retention, it is comfortable for patient (thin and light weight), it is resistant to fractures and is aesthetically good because translucent and pink shade matches that of natural tissues. Acrylic resin teeth do not bond chemically with flexible denture base resin. They are mechanically retained by making T shaped holes into which denture base resin flows to retain teeth mechanically.

The clasps of flexible removable partial dentures are extensions of denture base into undercut areas, which can be adjusted by dipping the clasp area in boiling water and then bending with the plier in or out to increase or decrease the retention. Flexible prosthesis is difficult to reline and rebase with soft tissue denture liners, acrylic resin and even with the other flexible denture base materials. It is difficult to repair and is prone to staining by various ingredients of food, tea and coffee if it is not polished properly and cleaned by the patient regularly. The patient should be instructed to practice good oral hygiene and clean prosthesis regularly after every meal, in order to maintain appearance and cleanliness of the prosthesis. The prosthesis should be removed during the brushing of the natural teeth, to avoid the scratching of the prosthesis.^{11,12,13}

Conclusion:

The fabrication of useful restoration is depending on the clinicians skills in selection of the type of the restorations which is required for the patient. The fabrication of prosthesis for the partially edentulous arches encountered a special challenge where many interferences, various path of insertion, tilted teeth and deranged occlusion will complicate the treatment plan. Flexible partial dentures can be a good option for the replacement of missing teeth when patient is concerned about aesthetics. Flexible dentures will stand in a superior position in fulfilling the various patients demand for more retentive and aesthetic treatment needs, but the proper care of prosthesis is required, in order to minimize the staining of the prosthesis,

which otherwise affects the aesthetics of the prosthesis later on. Flexible dentures were previously selected by few patients and the clinician but now a days it has become a better treatment option.

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The most effective and advanced technique of single visit Root canal in our daily practice

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Abstract:

The new WaveOne NiTi file system from DENTSPLY Maillefer is a SINGLE use, SINGLE file system to shape the root canal completely from start to finish. Shaping the root canal to a continuously tapering funnel shape not only fulfils the biological requirements for adequate irrigation to free the root canal system of all bacteria, bacterial by products and pulp tissue, but also provides the perfect shape for 3-D obturation with gutta percha. WaveOne files only shape the canal, extremely quickly in many instances, but they do not clean the root canal. It is the duty of teachers, clinicians, researchers and manufacturers should emphasize the role and importance of irrigation as a major determinant of endodontic success. Once it is fully appreciated that shaping and cleaning the root canal system are irreversibly tangled, then endodontics will be easier for all and available to all, and WaveOne will truly become the root canal preparation instrument of the future .

There are many dental surgeons who, for whatever reason are reluctant to use NiTi rotary instruments to prepare canals, despite the recognized advantages of flexibility, less debris extrusion and maintaining canal shape, amongst other advantages. For them, the use of a single reciprocating file will be very attractive both in terms of time and cost saving.

(Bangladesh Dental Journal 2012; 28: 54-59)

Introduction:

Single visit endodontic means to cleaning, shaping and disinfection of a root canal system followed by obturation of the root canal at the same appointment. The concept of single visit endodontics started at least 100 years back. Initiating and completing an endodontic treatment in one appointment has always been surrounded by controversy. In addition, the majority of endodontists thought that performing treatment in this manner would cause more postoperative pain than if performed in multiple appointments. But now many studies have shown that completing the treatment in single sitting show no difference in quality of the treatment, success rate and incidence of postoperative complications. However, a growing number of dentists are practicing more and more single visit endodontics through WaveOne reciprocating endodontic system.



Fig-1: WaveOne motor and 6:1 reducing handpiece

Criteria of case selection

1. Competence of the clinician.
2. Positive patient acceptance.
3. Absence of anatomical interferences.
4. Accessibility.
5. Availability of sufficient time to complete the case.
6. Pulp status.
7. Clinical symptoms.

Advantages of single visit Root canal

1. Convenience- Patient does not have to tolerate the discomfort of repetitive local anaesthesia, treatment procedure and postoperative recovery.

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2. Efficiency- The clinician does not have familiarize himself/herself to patient's particular anatomy or landmarks.
 3. Patient comfort- Single visit is more comfortable to patient due to less number of visits and less chance of local anaesthesia.
 4. Reduced intra-appointment pain- Sometimes the mid treatment visit increased caused by the leakage of the temporary cements.
 5. Economics- Extra cost may be included during multiple visit both for the patient and doctor as well.
 6. Minimizes the fear and anxiety- Especially for the psychological trauma and fear of dentist /dental chamber.
 7. Reduces incomplete treatment- Some patients do not continue their full treatment, due to loss of pain or cannot manage time anymore. So SVE can reduce this chance of missing.
 8. Lesser errors in working length- in multiple visit, a lot of errors may arise such as reference point may be lost due to coronal fracture or modification by grinding of the tooth and the actual working length may be changed.
 9. Restorative consideration- Immediate placement of coronal restoration /filling ensures effective coronal seal and esthetics.
3. Patients who require sedation every time.
 4. Non-vital teeth with sinus tract.
 5. Non-surgical retreatment cases.
 6. Medically compromised patients who require antibiotic prophylaxis.
 7. Physically compromised patients who can't come to dental clinics frequently.

Contraindications of single visit

1. Teeth with anatomic anomalies such as calcified and curved canals.
2. Asymptomatic non-vital teeth with periapical pathology and no sinus tract.
3. Acute alveolar abscess cases with frank pus discharge.
4. Patients with acute apical periodontitis.
5. Symptomatic non-vital teeth and no sinus tract.
6. Patients with allergies or previous flare-ups.
7. Teeth with limited access.
8. Patients who are unable to keep mouth open for long duration such as patients with TMJ disorders.

Advanced technology for single visit ROOTCANAL through Wave One rotary system:

Sizes of Waveone Single File

1. WaveOne small file – The tip of the file is ISO 21mm with a continuous fixed taper of 6%.
2. WaveOne primary file- The tip of the file is ISO 25mm and has a continuously decreasing taper from its tip to its shaft (0.8, 0.65, 0.6, 0.55).
3. WaveOne large file- The tip of the file is ISO 40mm and has a continuously decreasing taper from the tip to the shaft (0.8, 0.65, 0.6, 0.55).



Fig.-2: Wave One Files

Disadvantages of single visit endodontics

1. It is exhausting /tiring for patients to keep their mouth open for long duration.
2. If mid-treatment flare-up [intermittent pain] happens to occur, it is easier to establish drainage in a tooth which is not obturated. In case of obturated tooth, it is difficult to remove filling material.
3. Clinician may lack the proficiency to properly treat a case in single visit.
4. Some case can't be treated by single visit. For example cases with very fine, curved, calcified, multiple canals may not be treatable in single visit. If hemorrhage or exudation occurs, it becomes difficult for the clinician to control and complete the case in single visit.

Indications of single visit Root canal

1. Vital teeth.
2. Fractured Anteriors where esthetics is the concern.

- A. Yellow band file – Small size
- B. Red band file – Primary size
- C. Black band file – Large size

Selection of Waveone single file

Whilst a good preoperative periapical radiograph will give an indication of what to expect before the canal is prepared only the first hand file into the canal will aid in the selection of the WaveOne file as follows:

1. If a 10 k-file is very resistant to movement, use WaveOne Small file.
2. If a 10 k-file moves to length easily, is loose or very loose, use WaveOne primary file.
3. If a 20 hand file or large goes to length, use WaveOne large file.
4. If a 10 k-file is very resistant to movement, use WaveOne Small file.
5. If a 10 k-file moves to length easily, is loose or very loose, use WaveOne primary file.
6. If a 20 hand file or large goes to length, use WaveOne large file.

Procedures of Waveone single file shaping

1. Take hand file into canal and watch-wind to length or resistance.
2. Use appropriate WaveOne file to approximately two-thirds of canal length.
3. Irrigate copiously.
4. Take hand file to length and confirm with the apex locator and radiograph.
5. Take Wave One file to length.
6. Confirm foramen diameter with hand file the same sizes Wave One file, if comfortable, preparation is complete.
7. If foramen diameter is larger than the WaveOne file, consider the next larger WaveOne file.
8. Majority of cases will be completed with WaveOne primary file.

Clinical procedures or guidelines for the use of Waveone instruments in details

Guideline 1: Create straight line access

It is important to prepare an adequate access cavity that will ensure straight line access into each root canal system after removal of all the pulp chamber contents. Ultrasonic instruments are very useful instruments to remove any pulp calcification and to refine the access cavity walls to improve straight line access. The recommended method of use is to introduce the file into the coronal portion of the root canal ensuring that the file is able to rotate freely.

Restrictive dentine is then removed using a backstroke, outwards brushing motion. This step will also relocate the canal orifices more mesially and pre-flare the coronal third of the root canal.

Guideline 2: Negotiate canals to patency and create a reproducible glide path

The author prefers to negotiate each root canal with a size 08 or 10 k-file until apical patency is established. According to Ruddle (2012) one of the greatest challenges of endodontic treatment is the ability to find, follow and predictably secure any given canal to its terminus. Apical patency is the ability to pass small K-File 0.5-1 mm passively through the apical constriction, beyond the minor diameter without widening it.

After working length determination and radiographic confirmation, a reproducible glide path should be established. According to west a glide path is a smooth passage that extends from the glide path should be the same size as, or ideally a size bigger than the first rotary instrument that will be introduced into the root canal system.

Guideline 3: Enlarge the glide path

It is recommended to enlarge the glide path to either a size 15 K file manually or by using rotary PathFiles of ISO 19.

PathFile NiTi rotary files were introduced to the market in 2009 specifically for the purpose of glide path preparation. The system consists of three instruments which are available in 21mm, 25mm, and 31mm lengths. They have a square cross section and a 2 percent taper, which makes them resistant to cyclic fatigue, ensures flexibility and improves cutting efficiency. The tip angle is 50 degrees and is non-cutting, which reduces the risk of ledge formation.

Pathfile NO.1 [purple] has an ISO 13 tip size, PathFile NO.2 [white] has an ISO 16 tip size and PathFile NO.3 [yellow] has an ISO 19 tip size facilitates progression of the files. The manufacturer suggests using the PathFile No.1 only after a size 10 k-file has been used to explore the root canal to working length.

The advantages of using NiTi rotary instruments for glide path preparation are-reduced canal preparation time, reduced canal aberration [ledges, zips and apical transportation] with improved maintenance of original anatomy, reduced apical extrusion of debris and post operative pain, less operator and hand fatigue.

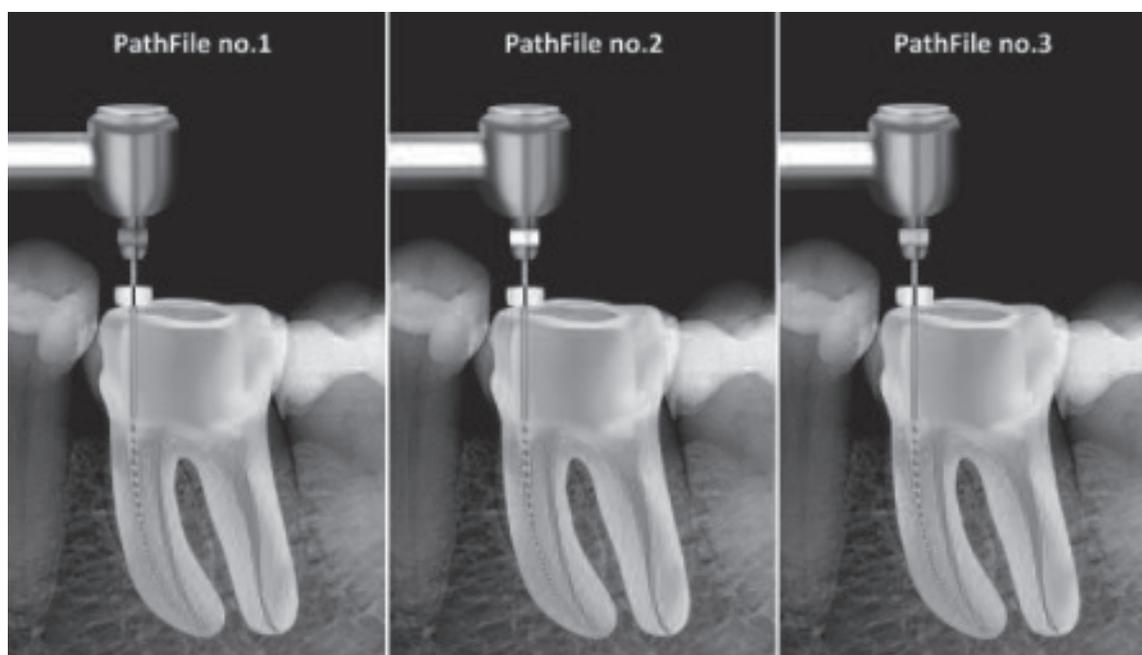


Fig.-3: PathFiles no. 1, 2 and 3 are taken in rotary motion gradually to full working length to enlarge the glide path.

Guideline 4: Select the correct WaveOne file

The following guidelines can be used for WaveOne file selection after a reproducible glide path of size ISO 15-19 [hand or PathFiles] has been established.

- a. WaveOne Small File [21/06, yellow ring]
 - i. Canals with severe curvatures in the apical parts of the root canal system.
 - ii. Very long root canals.
 - iii. Very narrow and complex mesio-palatal canals on upper molars.
- b. WaveOne Primary File [25/08, red ring]
 - i. Majority of root canals [average length, moderate curvatures in midroot and apical parts.]
- c. If the first instrument to working length is a size 25 or larger it is recommended to use the WaveOne large file [40/08, black ring]

This file is mainly indicated for larger diameter and relatively straight root canals.

Guideline 5: Canal preparations

Preparation is done with a progressive inward (light apical directed force) and outward circumferential brushing motion with the WaveOne instrument of choice in 3mm cycles (root canal must be filled with irrigation solution of choice)

A controlled and disciplined way to ensure a cutting cycle of 3mm at a time, is to insert the instrument into the root canal [after glide path enlargement] and record the initial depth of file penetration by adjusting the rubber stop to that reference point on the cusp tip of the tooth. Remove

the instrument from the root canal and record the length. Move the rubber stop to a working length of 3mm longer than the initial recorded length. The objective with the first cutting cycle will be to only cut with the instrument until the rubber stop reaches the cusp reference point, thereby ensuring that a maximum of 3mm of cutting is achieved before the file is removed to clean the debris from the cutting flutes and from the root canal.

Guideline 6: Clean the cutting flutes of the instrument after each cycle

The flutes of the instruments collect cutting debris very quickly because most of the work is done with a single instrument. Failure to clean the flutes of the instrument and the cutting debris from the root canal regularly will result in a decrease in cutting efficiency, resulting in the operator exerting more apical pressure on the instrument with a higher risk of possible file fracture.

Guideline 7: Irrigate and recapitulate the root canal system after each cutting cycle

Before the next cutting cycle, the debris from the root canal system must be removed and the clinician must ensure that the glide path is still reproducible and the canal is patent. This is achieved by placing irrigation solution [Copious irrigation with 5% NaOCl and EDTA] into the root canal followed by inserting a 08 or 10 k-file to full working length, using a watch-winding motion [recapitulation], followed by a final irrigation step. The objective of recapitulation is to loosen up any compacted debris and move it back into the irrigation solution before it is flushed out of the canal. The root canal and the instrument are now ready for the next cutting cycle.

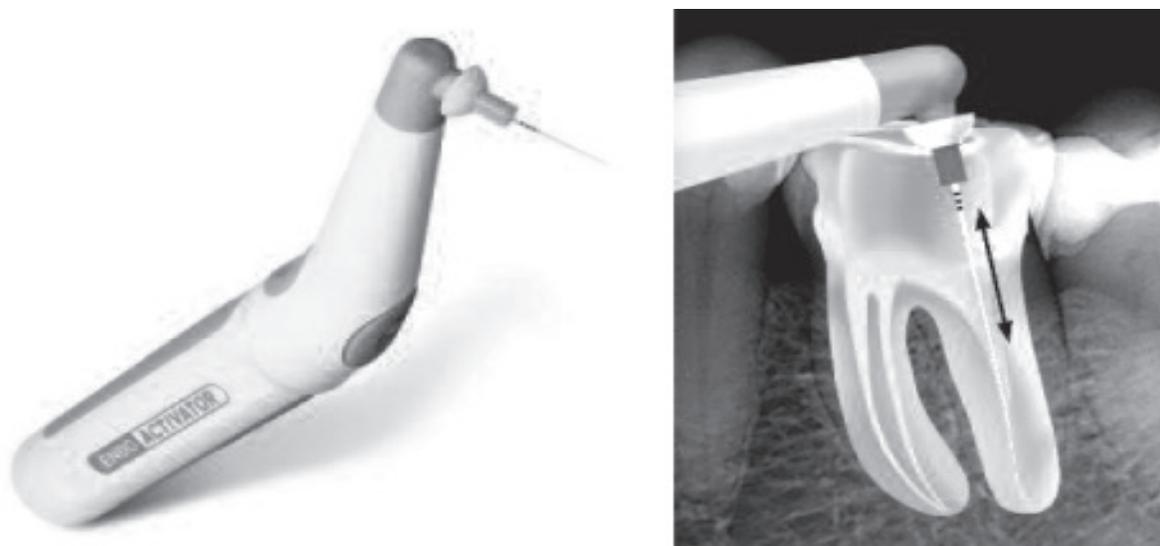


Fig.-4: *The EndoActivator and irrigating the prepared root canals.*

Guideline 8: Easy and faster biomechanical preparations

Faster preparation time necessitates longer irrigation times preferably with activation of irrigation solution. Chemo-mechanical debridement that allows elimination of pulpal tissue, microbiota and their by-products, and organic and inorganic debris removal by using mechanical instruments and intracanal irrigation solutions is one of the most important objectives of endodontic treatment. According to Dunavalant et al [2006], sodium hypochlorite along with the use of ethylenediamine-tetraacetic acid [EDTA] is able to achieve the goal of chemical debridement.

There is increasing evidence to support that the activation of fluid in well-shaped root canals can play a strategic role in the debridement and disinfection into all aspects of root canal systems, including dentinal tubules, lateral canals, fins, webs and anastomoses. The author would suggest to use the EndoActivator [Dentsply/Maillerfer] to activate irrigation solutions after root canal preparation with the WaveOne reciprocating instruments.

The EndoActivator [Dentsply/Maillerfer] is a sonically driven root canal irrigation activation device. It consists of a battery operated portable hand piece and different sizes of disposable, strong, flexible polymer tips. Sonically vibrating the polymer tip, in combination with moving the tip up and down in a short vertical stroke, synergistically produces a powerful hydrodynamic phenomenon. According to Caron [2007] this activation technique is capable to clean debris from lateral canals, remove the smear layer, and dislodge clumps of stimulated biofilm within curved canals of molar teeth.

Guideline 9: Guidelines for obturation

Some articles recommend that the final shape can be confirmed when the apical flutes of the final shape can be



Fig.-5: *WaveOne matching paper points*



Fig.-6: *WaveOne matching gutta-percha points*



Fig.-7: *WaveOne matching ThermoFil obturators*

confirmed when the apical flutes of the instrument are loaded with dentin debris. However, in the author's clinical experience this is not always a reliable method although it can be used as a guideline.

Gauging the apical foramen with a corresponding NiTi hand file is another alternative. For example, if the final canal preparation was done with a primary WaveOne 25/

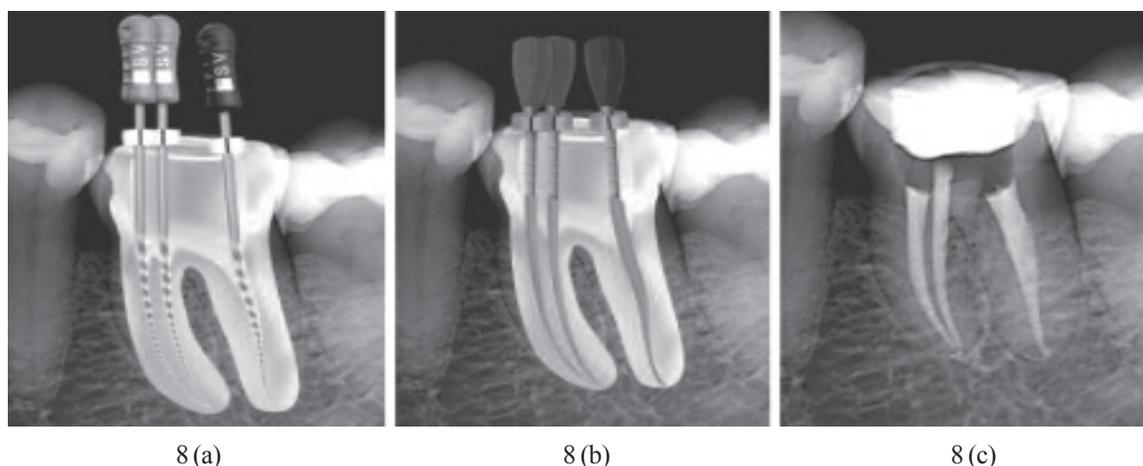


Fig.-8: (a). GuttaCore NiTi varifiers are used to verify the final canal shape. 8 (b). GuttaCore/guttapercha obturators used for root canal obturation. 8 (c). Final radiography result after root canal obturation.

08 instrument a size 25/02 NiTi hand file is fitted into the prepared canal. If the tip of the file is snug at length the final shape is confirmed and a matching WaveOne Primary Gutta-percha Point [Dentsply/Maillefer] is used for obturation.

Conclusion:

The WaveOne system is an exciting new concept in the preparation of the single visit root canal. Whilst current teaching advocates the use of multiple NiTi files of different diameter and taper to gradually enlarge the root canal, only one WaveOne single shaping file is required to prepare the canal to an adequate size and taper, even in narrow and curved canals.

WaveOne files only shape the canal, extremely quickly in many instances, but they do not clean the root canal. It is the duty of teachers, clinicians and manufacturers to emphasise the role and importance of irrigation as a major determinant of endodontic success. Once it is fully appreciated that shaping and cleaning the root canal system are irrevocably intertwined, then endodontics will be easier for all and available for all.

Drs Julian Webber, Pierre Machtou, Wilhem Pertot, Sergio Kuttler, Clifford Ruddle and John West were involved in the development, field testing and research associated with WaveOne.

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Infective endocarditis and dental considerations

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Abstract:

Infective endocarditis is a condition in which the heart valves are invaded by microorganisms usually bacteria. The hallmark of infective endocarditis is the presence of large friable vegetations on the heart valves. The vegetations consist of platelet and fibrin and surround the microorganisms and seem to protect them from normal host defenses and antibiotics. Some dental procedures in some patients may cause development of bacterial endocarditis. Bacterial endocarditis due to dental procedures is largely preventable by taking appropriate measures.

Key words: bacterial endocarditis, dental procedures, antibiotic prophylaxis.

(Bangladesh Dental Journal 2012; 28: 60-61)

Introduction:

Infective endocarditis is a condition in which the heart valves are invaded by microorganisms. Usually bacteria are the principal causative agent and hence the condition is named as bacterial endocarditis. However apart from bacteria other organisms like fungi and viruses are capable of causing this condition and hence it is named as 'infective endocarditis. The hallmark of infective endocarditis is the presence of large friable (light) vegetations on the heart valves. The vegetations consist of platelet and fibrin and surround the microorganisms and seem to protect them from normal host defenses and antibiotics. The vegetations may be single or multiple and may involve more than one valve. The appearance of vegetation is influenced by the type of microorganism responsible for the infection and the degree of host immune response to the infection. The aortic and mitral valves are the most commonly affected although the tricuspid valve may also be involved particularly in intravenous drug abusers. Some dental procedures in some patients may cause development of bacterial endocarditis. Bacterial endocarditis due to dental procedures is largely preventable by taking appropriate measures.¹

Virtually any type of microorganism is capable of causing infective endocarditis although most cases are caused by

bacteria. Blood borne bacteria (bacteremia) are the requirements for infective endocarditis. Acute and subacute bacteremia may result due to infection elsewhere in the body e.g periodontitis, dental treatment procedures, surgical procedures and urinary catheterization. Infection occurs when microorganisms are implanted on the endocardial surface during episodes of bacteremia. Bacteria causing infective endocarditis have been subdivided into two groups: high virulence and moderate to low virulence. Coagulase positive *Staphylococcus aureus* is highly virulent and commonly causes acute bacterial endocarditis. The viridans group of *Strepto cocci* is low virulent commensals in the oral cavity and commonly causes subacute bacterial endocarditis.²

Risk factors:

1. Cardiac abnormalities: Any cardiac abnormality that increases hemodynamic trauma to the endocardial surface such as high pressure shunts within the heart e.g ventricular septal defect or chronic valvular disease (rheumatic fever) increases the risk of infective endocarditis.
2. Prosthetic heart valve.
3. Intravenous drug abusers.
4. Immune suppression.³

Dental Considerations: The most important goal of dental treatment in patients with valvular heart disease and prosthetic heart valve is to prevent infective endocarditis. The dental treatment procedures known to induce gingival or mucosal bleeding may cause transient bacteremia that rarely last for more than 15 minutes. However within 15 minutes bacteria may lodge (stick) themselves on previously injured or abnormal heart valve which may result in infective endocarditis. The patients with cardiovascular disease who are associated with risk of infective endocarditis are grouped into:

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Antibiotic prophylaxis against Subacute Bacterial Endocarditis⁵:

| Situation | Agent | Regimen |
|--|--------------|--|
| Standard prophylaxis | Amoxycillin | Adults: 2 gChildren: 50 mg/kg orally 1 hour before procedure. |
| Unable to take oral medication | Amoxycillin | Adult: 1 g IV/IMChildren: 50 mg/kg IV/IM |
| Allergic to Penicillin | Clindamycin | Adults: 600 mgChildren: 20 mg/kg 1 hour before procedure. |
| Allergic to Penicillin and unable to take oral medication | Cefazolin | Adults: 1 gChildren: 25 mg/kg 30 minutes before surgery. |

1. Negligible risk category: The low risk category includes patients with implanted cardiac pace makers, previous history of coronary artery bypass graft (CABG).
2. Moderate Risk group: The moderate risk category includes patients with patent ductus arteriosus, atrial septal defect, ventricular septal defect, aquired valvular dysfunction (due to rheumatic fever).
3. High risk Category: high risk category includes patients with prosthetic heart valves, previous history of infective endocarditis, complex cyanotic congenital heart disease (Fallot's tetralogy) and surgically constructed systemic pulmonary shunts.

The American Heart Association recommends antibiotic prophylaxis prior to dental treatment (e.g dental extractions, periodontal surgery, intra ligamentary local anesthetic injection, periapical surgery) for risk category patients antibiotic prophylaxis should be initiated one hour before

surgery and should not be continued for more than 6-8 hours.⁴

Conclusion:

Bacterial endocarditis due to dental procedure is largely preventable. Appropriate prophylaxis should be given to risk category patients before surgery.

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Management of postoperative dental pain

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(*Bangladesh Dental Journal 2012; 28: 62-63*)

Treatment of pain and suffering should be a priority for all clinicians. In dental practice we use analgesics for postoperative pain management. Numerous analgesics are available for use. The purpose of this article is to provide a brief review of the drugs that should be considered for the management of postoperative dental pain.

Acetaminophen: It has analgesic and antipyretic properties. It has less side effects than nonsteroidal anti-inflammatory drugs (NSAIDs). Acetaminophen is a drug of choice if NSAIDs are contraindicated.¹ In severe pain acetaminophen alone is not sufficient. It may be used in combination with opioids such as codeine and oxycodone.

NSAIDs: It is effective for the management of any level of dental pain.² It has analgesic and anti-inflammatory action. Acetylsalicylic acid (ASA) is a well-known antipyretic and is widely used for its antiplatelet action for prophylaxis of myocardial infarction in patients with a history of unstable angina pectoris or with a history of myocardial infarction.³ In severe pain where acetaminophen is insufficient and patient has gastric ulcer then we consider a selective Cox-2 inhibitor like celecoxib, rofecoxib or etoricoxib.⁴ Ketorolac tromethamine is a NSAID which is used in postoperative dental pain

and administered by oral or parenteral route but not exceed 5 days.⁵

Therapeutic doses: Acute pain in adults with moderate to severe pain following oral surgery reduces after administration of ibuprofen 400 mg, diclofenac 50 mg, etoricoxib 120 mg, codeine 60 mg plus acetaminophen 1000 mg, celecoxib 400 mg, and naproxen 500/550 mg.⁶

Adverse effects: NSAIDs cause dyspepsia to more seriously gastric bleeding. Acetaminophen has less side effects but excessive doses can lead to irreversible liver damage. Long-term use of acetaminophen or NSAIDs should be avoided as it may lead to renal toxicity.⁷

Drug interactions: Long-term use of NSAIDs diminishes the action of antihypertensive drugs like angiotensin-converting enzyme inhibitor (enalapril), diuretic (hydrochlorothiazide) and beta-blocker (propranolol).⁸ Patients on an anticoagulant like warfarin and powerful antiplatelet drugs like clopidogrel which are used to prevent acute coronary syndrome or stroke will be susceptible to increase bleeding and ASA in particular must be avoided. ASA should be avoided in diabetic patients taking oral hypoglycemics.⁹

Prescribing considerations: NSAIDs can be more effective analgesics if they are given early and in sufficient doses i.e. initial loading dose should be double the maintenance dose.³

Opioids: Opioid analgesics may be used to manage postoperative dental pain. It is considered when acetaminophen or NSAIDs alone is not sufficient. High doses are very effective for the relief of severe pain. But opioids have some unacceptable side effects. All opioids induce dose-dependent respiratory depression, sedation, constipation, nausea and vomiting.¹⁰

Opioids should be considered in dental pain only in combination with NSAIDs or acetaminophen. If it is used alone then codeine should be the first considered. If the codeine is insufficient the next opioids to consider is oxycodone. This drug is most commonly available with ASA or with acetaminophen.¹⁰

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Use of analgesics in pregnancy and lactation:

Management of dental pain in pregnancy is to remove the source of pain using local anaesthesia. If post operative pain present, an analgesic may be necessary. Acetaminophen is the analgesic of choice in all stages of pregnancy. ASA should not used in late pregnancy. NSAIDs may cause insufficient contraction during labour, increased during delivery or premature closure of the ductus arteriosus of the heart. NSAIDs are therefore contraindicated in the third trimester.

If acetaminophen is insufficient, opioids are considered during pregnancy. But they are given in short duration. Chronic opioids use can result in fetal dependence, premature delivery and growth retardation.¹¹

Acetaminophen is the analgesic of choice in lactation. Opioids are considered safe in lactation.¹¹

Use of analgesics for pediatric patients: In young patient ASA is contraindicated as it can induce Reye's syndrome. Acetaminophen is the drug of choice for the pediatric patient. For pain of higher level ibuprofen or codeine can be used.¹²

Use of analgesics for elderly patients: In elderly patient acetaminophen is the analgesic of choice. NSAIDs cause gastrointestinal bleeding if there is a history of gastric bleeding or if high doses of NSAIDs are used. If acetaminophen is insufficient then consider selective COX-2 inhibitor over other NSAIDs. Opioids has profound adverse effects and prolonged duration of action. Therefore it is best not to select an opioid.³

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