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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 09, case reports 03 and review articles 02 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

“Proposed career plan for Doctors, Nurses & Paramedics in Bangladesh”-A descriptive type of cross sectional explorative study

Talukder MHK¹, Nazneen R², Hossain MZ³

Abstract:

A career can be defined as a person's progress within an occupation or series of occupations involving self-assessment, career exploration, targeting, career preparation, marketing and career management. In Bangladesh there is no definite career plan for the doctors, nurses and paramedics serving in the health sectors for which most of them serve at their entry post till their retirement. This situation calls for the development of career plan for doctors, nurses & paramedics serving in health sector. The objective of this study was to develop career plan for doctors, nurses & paramedics serving in health sector. After doing extensive literature review, concept paper was developed and the objectives were discussed among the participants. Proposed career plan was finalized after a focused group discussion followed by recommendations & suggestions. Study revealed that major Events of the Proposed career plan for doctors are, up gradation of DG post. Four major pillars are - Teaching, Administration, Clinical & Hospital Services, Public Health sector. Bottle neck is at the grade 8 with existing very few posts. Posts to be created at grade 9, 8, 7, 5, 2 & 1. Posts not to be increased at grade 6, 4 & 3 (if total number of posts are remain same at grade 9). Promotional opportunities are sequentially less in upward direction. Proposed hierarchical Career plan for the Nurses is Director, Div. Deputy Director, Assistant Director and Nursing Officer. Entry point in Medical Technology is diploma in the subject. Next step is the post of the Lecturer or Chief Medical Technologist. Next is the Superintendent and finally Assistant Professor after 5 years and Professor after 3 years of experiences. Career plan to be developed by proper integration of health, family planning and nutrition sector. It is recommended that more active involvement of doctor's, nurses and paramedics are essential to finalize the need based career plan for the country to ensure the categorical development.

Key Words: Career plan, doctors, nurses, paramedics.

(Bangladesh Dental Journal 2014; 30: 1-10)

Introduction:

A career can be defined as a person's progress within an occupation or series of occupations. It is more than just a job or someone's occupation but includes the progress through life, growth and development in vocational areas of life¹.

A career plan outlines the steps which need to take to reach to career goal. It determines skills and interests, what career best suits someone's talents, and what skills and training need for someone's chosen career².

Career planning is an individual activity that occurs throughout a person's working lifetime. It is indeed a

subcomponent of life planning and is influenced by many factors but focuses on work and work environments¹. Effective career planning is a process that involves the total person. Comprehensive career planning stresses the importance of knowing enough about someone's unique attributes, about specific career fields, and about someone's life priorities.

Successful career decisions are based on, current information & accurate information. Right to Information (RTI) can help in this regard¹.

Ten Tips for Successful Career Planning are as follows-

Make career planning and annual event. Map path since last career planning. Reflect on likes and dislikes, needs and wants. Examine pastimes and hobbies. Make note of past accomplishments. Look beyond current job for transferable skills. Review career and job trends. Set career and job goals. Explore new education/training opportunities. Research further career/job advancement opportunities³.

Career planning process is ongoing and sequential. When career change is desired anytime during work life, the process may repeat once again¹.

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Major Three Steps in Career Planning :

First, realistic assessment of strengths, weaknesses, and interests. Second, exploration of the options. Finally, consideration of the issues that can affect plans⁴.

Six Steps of Career Planning Process are as follows-

Step-1: Self-Assessment :

It is simply a way to enhance self-understanding. It is being able to describe someone's unique characteristics clearly and accurately regarding- skills, values & interests.

Step -2: Career exploration :

How do someone's skills, values and interests correspond to the types of work he/she is considering?

For exploring career information there are generally four ways of gathering career information: reading everything about careers -Begin by skimming, talking to people, participating in field experiences/internships, enrolling in key courses.

Step -3: Targeting

Among the investigated number of career alternatives, one primary career goal should be targeted.

Step -4: Career Preparation :

Once someone has made a career decision, the next task is to begin planning how to prepare for the career, how to get experience in it, and how to actually enter the field. Identification of the degree of effort and all the things which are required to be successful in chosen career. What are the specific educational and experiential requirements? Qualifications required by that career, which someone currently possess, and which ones do need to acquire? How will someone obtain the best qualifications, additional education, internships, special courses or training?

Step -5: Marketing :

There is a great deal to be learned regarding obtaining employment, even after someone has prepared for a career field with a major where there are few positions that appear directly related some one's studies. The job search process is analogous to conducting a marketing campaign.

Step -6: Career Management :

An ideal job should be one that educates and prepares someone for an even better one. Going to work as a professional is very different from just attending school. One can return to Step 1: Self Assessment and begin a new process, anytime during someone working years as often as desire. The key to success is being prepared¹.

Career planning can be done mainly at three levels such as individual, institutional/organizational & national. In Bangladesh level of career planning is mostly and mainly at individual level. Limited scopes, indirect initiatives at national/country level. Lack of time felt need based co-ordination among the concerned bodies/organizations in regards to career planning and it's proper implementation. If all the doctors, nurses, paramedics are not interested to

be updated, what should be the role of the country in such a situation? Are the country properly prepared for facing that? The answer is that country needs effective comprehensive updated career plan with transparent strategies & guidelines. Considering- country need and context, resources, target groups - (doctors/nurses/paramedics) (Service/teaching/administration), target area-hard to reach, remote rural, developing transparent strategies at different levels of career path.

In Bangladesh there is no definite, clear cut, career plan for the doctors, nurses and paramedics serving in the health sectors. Due to that, most of the doctors, nurses & paramedics serve at their entry post till their retirement. After a certain time of their serving, social degradation lead them to be frustrated. Which ultimately hamper the health care delivery and teaching. It has a strong negative impact on the development process of production of competent future doctors, nurses & paramedics and ensuring effective cordial health care delivery. As a product of human being oriented curriculum, peoples expectations are high and is increasing day by day from those doctors, nurses, paramedics regarding empathetic behavior and ethical practices as professional persons. But due to lack of their specific transparent career plans they are becoming demoralized, insincere, demotivated to their job as a teacher and also as a health care provider. So it is very essential to develop career plans for doctors, nurses & paramedics.

Materials & Methods :

After doing extensive literature review, concept paper was developed for the first consultative meeting among the Administrators, policy makers, stake holders, principals, vice principals, professors, deans & faculty members of different organizations.

The objectives were discussed among the participants. A formal presentation on "Career Planning" was delivered followed by an interactive discussion among the participants . After discussion, all the participants were divided into three groups to work on drafting updated career plan for doctors, nurses & paramedics separately in three groups.

Specific tasks of each group were- chalking-out a plan for reviewing the existing career plan and suggesting guidelines for updating it.

Finally, all the suggestions and recommendations were presented by each groups and all the agreed points by the groups were accepted for drafting career plan.

A formal presentation on "Out line of the proposed career plan for doctors, nurses and paramedics" was distributed among the participants.

Recommendations & suggestions were noted down by the facilitators. As per the recommendations & suggestions, members of the core group worked together and finalized the following proposed career plan for doctor's, nurses and paramedics in Bangladesh.

Results:

All the collected data are presented in the following tabular form as results of this study —

Table-I
Proposed Career Plan for Doctors under DGHS, MOH&FW⁵

Grade	Existing Posts	Proposed Promotional opportunity	Posts to be created	Tentative duration of service & criteria	Hierarchy of Posts							
					ADG (Medical Education)	ADG (Admin)	ADG (Clinical & Hospital Services)	ADG (Public Health)	ADG (Planning & Research)	ADG (Finance)	ADG (NCD & DC)	ADG (MIS)
1	0 (Cadre + Permanent + Temporary)	1	1 (1-0)		DG							
2	06 (6+0+0)	1% 25	19 (25-6)									
3	503 (260+12+231)	05% 67(503)	- (67-503)=-436		Director (UGME) Director (PGME) Director (Paramedical E) Director (DE)/ Director (AME) Principal MC/vice Principal MC /Professor	Director (Medical personnel) Director (Non Medical personnel) Director (Support staff) Divisional Director, Additional Divisional Director	Director (Tertiary care) Director (Secondary care) Director (Private clinics, hospitals & labs), Director (AMC) Additional Director, Superintendent, Additional Superintendent, Chief Consultant (Medicine, Surgery, Gynae, Eye, ENT, Pathology, Radiology, Paediatrics, Dermatology, Cardiology, Orthopaedics, Dentistry)	Director (PHC & CC), Director (Disease surveillance), Director (Disaster Management) Chief Public Health Specialist (CPHS)	Director (Planning) Director (Research)	Director (finance) Director (Budget), Director (Audit)	Director (NCD) Director (DC)	Director (PMIS), Director (LMIS), Director (FMIS), Director (SMIS)

4	667 (351+20+296)	10% 249(667)	- (249-716)=-467		DD (UGME) DD(PGME) DD(Paramedical E) DD(AME) DD(DE)/Associate Prof/Principal IHT, Principal MATS Principal (AME)	DD(Medical personnel) DD (Non Medical personnel) DD (Support staff), Deputy Divisional Director (Admin & Finance), Deputy Divisional Director (PH), Deputy Divisional Director (Clinical & Hospital Services)	DD (Tertiary care) DD (Secondary care) DD (Private clinics, hospitals & labs), DD (AMC) Deputy superintendent, Senior Consultant (Medicine, Surgery, Gynae, Eye, ENT, Pathology, Radiology, Paediatrics, Dermatology, Cardiology, Orthopaedics, Dentistry)	DD (PHC&CC), DD (Disease surveillance), DD (Disaster Management) Senior PHS	DD (Planning) DD (Research)	DD (Budget), DD (Audit) DD(Finance)	DD (NCD) DD (DC)	DD (PMIS) DD(L MIS) DD(FMIS) , DD(SMIS)
5	530 (424+27+79)	20% 1246	716 (1246-503)		AD(UGME) AD(PGME) AD(Paramedical E) AD (DE) AD (AME) Assist. Prof.	CS, Additional CS/ AD(Medical personnel) AD (Non Medical personnel) AD (Support staff), AD(Admin & Finance), AD (PH), AD(Clinical & Hospital Services)	AD (Tertiary care) AD (Secondary care) AD (Private clinics, hospitals & labs), AD (AMC) Asstt. superintendent, Additional Consultant (Medicine, Surgery, Gynae, Eye, ENT, Pathology, Radiology, Paediatrics, Dermatology, Cardiology, Orthopaedics, Dentistry)	AD (PHC&CC), AD (Disease surveillance), AD (Disaster Management) Additional PHS	AD (Planning) AD (Research)	AD (Budget), AD (Audit) AD (Finance)	AD (NCD) AD (DC)	AD (PMIS) AD(L MIS) AD(FMIS) , AD(SMIS)
6	4154 (2757+41+1356)	30% 1545(4154)	- (1545-4154)=-2609		RS/RP/Registrar RS/RP/Registrar (AME)	DCS (Admin & Finance), DCS (PH), DCS (Clinical & Hospital Services),UHFPO, Additional UHFPO	Joint Consultant (Medicine, Surgery, Gynae, Eye, ENT, Pathology, Radiology, Paediatrics, Dermatology, Cardiology, Orthopaedics, Dentistry)Joint Consultant (AMC), RMO	Joint PHS				
7	647 (509+79+59)	40% 3863	3216 (3863-64)		Senior Lecturer/Asstt. Reg. Senior Lecturer (AME)	Deputy UHFPO (Admin & Finance), Deputy UHFPO (PH), Deputy UHFPO(Clinical & Hospital Services), Deputy UHFPO (field services)	Deputy Consultant (Medicine, Surgery, Gynae, Eye, ENT, Pathology, Radiology, Paediatrics, Dermatology, Cardiology, Orthopaedics, Dentistry)Deputy Consultant(AMC) Asstt. Reg./	Deputy PHS				

8	31 (8+9+14)	50% 7726	7695 (7726-31)		Lecturer Lecturer (AME)	Asstt. UHFPO (Admin & Finance), Asstt. UHFPO (PH), Asstt. UHFPO (Clinical & Hospital Services), Asstt. UHFPO (Field services)	Asstt Consultant (Medicine, Surgery, Gynae, Eye, ENT, Pathology, Radiology, Paediatrics, Dermatology, Cardiology, Orthopaedics , Dentistry)Asstt Consultant (AMC)	Asstt. PHS				
9	12876 (6545+ 3568+2 763)	60 %	-	3 years	Junior Lecturer /Asstt. Surgeon/M, MO (AME)	Asstt. Surgeon/MO (Clinical services) MO (Field Services) at SC & CC	Asstt. Surgeon/MO (Clinical services) MO (Field services) MO (AMC)	Asstt. Surgeon/MO (Clinical services) MO (Field services)				
Pillars	→				Teaching	Administration	Clinical & Hospital Services	Public Health	Planning Research & Finance	NCD& DC	MIS	

Table-I shows Major Events of the Proposed Career Plan for Doctors-

- DG post is upgraded to grade 1
- Major pillars are four (Teaching, Administration, Clinical & Hospital Services, Public Health)
- Four ADG from four major pillars + four ADG from others (Planning & Research, Finance, NCD & DC, MIS)
- Bottle neck is at the grade 8 with existing very few posts
- Posts to be created at grade 9, 8, 7, 5, 2, 1
- Posts not to be increased at grade 6, 4, 3 (if total number of posts are remain same at grade 9)
- Promotional opportunities are sequentially less in upward direction

Table-II.A
Proposed Career Plan for the Nurses under the Directorate of Nursing Services (DNS)⁵

Pay Scale (as par Scale of 2005)	Grade	Office of the DNS	College of Nursing (Post Basic Colleges)/ Nursing College	Nursing Research Cell	Nursing Institute/ Nursing Institute	Staff development college	Hospital (Above 250 bedded)
		1	2	3	4	5	6
19300-	2	Directorate General Additional DG					
16800- 20700/-	3	Director-Admin/ Education/HR/ Higher educ/ Disciple /Planning & evaluation.	Principal Vice-Principal Professor	Director-Research cell		Director-HRD	
15000- 19800/-	4	Deputy Director	Associate Prof	Chief Scientific officer	Principal	Chief Trainer	Chief Nursing super
13750- 19250/-	5	Project Officer			Vice-Principal Chief Instructor		Nursing Super
11000- 17650/-	6	Assistant Director	Assistant Prof Senior Lecturer	Senior Scientific officer/ Senior Statistician		Senior Trainer	Deputy Nursing Super
9000-15480/-	7				Senior Instructor	Trainer	
7400-13240/-	8						
6800-13090/-	9	Nursing Officer Research officer Public Relation officer Legal officer	Lecturer	Scientific /Research officer Statistician	Instructor	Coordinator	Charge Nurse / Nursing Officer/OT Nurse/ Clinical specialist/ infection control nurse/ occupational health nurse
5100-10360/-	10				Instructor Associate		Senior Staff Nurse Certified Midwife Public health Nurse
4100-8820/-	11						
3700-8060/-	12						Jr Nurse-Midwife
3500-7500/-	13						Assistant nurse
3300-6940/-	14						
3100-6380/-	15						

Table-II.B*Proposed Career Plan for the Nurses under the Directorate of Nursing Services (DNS)⁵*

Pay Scale (as per Scale of 2005)	Grade	Division	Civil Surgeon office District	DCEC	RNTC	Hospital Upazila level	Hospital 100-250 bedded	Polly Shyatha Kendra
		7	8	9	10	11		
19300-	2							
16800- 20700/-	3	Director- Div.						
15000- 19800/-	4	Deputy Director						
13750- 19250/-	5			Chief coordinator / Chief Trainer			Nursing Super	
11000- 17650/-	6	Assistant Director	Senior DPHN	Senior Trainer	Chief coordinator/ Senior Trainer		Deputy Nursing Super	
9000- 15480/-	7					Assistant Nursing Super		
7400- 13240/-	8							
6800- 13090/-	9	Nursing Officer	District Public Health Nurse/ Disaster Nurse/ Industrial Health Nurse/ School health Nurse	Trainer	Trainer	Charge Nurse / Nursing Officer/ OT Nurse	Charge Nurse / Nursing Officer/OT Nurse/ Clinical specialist/	Charge Nurse / Nursing Officer/ OT Nurse
5100- 10360/-	10			Coordinato r	Coordinator	Senior Staff Nurse Certified Midwife Public health Nurse	Senior Staff Nurse Certified Midwife Public health Nurse	Senior Staff Nurse Certified Midwife Public health Nurse
4100-8820/-	11							
3700-8060/-	12					Jr. Nurse- Midwife	Jr. Nurse- Midwife	Jr. Nurse- Midwife
3500-7500/-	13						Assistant nurse	
3300-6940/	14							
3100-6380/-	15							

Table-II shows the Proposed Career plan for the Nurses under the Directorate of Nursing Services (DNS). Proposed hierarchical plan is Director–Div. → Deputy Director → Assistant Director → Nursing Officer.

Table-III

Draft career planning for Medical Technologist (Lab/RG/DT/PT/RT/Pharmacy) at different level of Health services.

Class	Name of post	Qualification & Experiences	Service (General)	Academic	Administration
1 st	Professor/ principal/Director	By promotion from Assoc. Prof. with 3 years experiences	-	Prof./ Principal	Director
1 st	Vice principal/ Assoc. Prof./ Deputy Director	By promotion from Asstt. Prof./Superintendent with 5 yrs experience in relevant field.	-	Assoc. Professor	Deputy Director
1 st	Asstt. Prof./Superintendent/ Asstt. Director (Lab/RG/DT/PT/RT/ Pharmacy)	By promotion from Lecturer to Asstt. Prof. And from Chief Technologist to Superintendent with 5 yrs experience OR M.Sc. in relevant subject.	Superintendent	Asstt. Professor	Asstt. Director
1 st	Lecturer/Chief Medical Technologist(Lab/RG/ DT/PT/RT/Pharmacy)/ Optical Maintain officer	By promotion from Instructor to Lecturer and from Senior Medical Technologist to Chief Medical Technologist with 5 yrs. Experience in relevant field. & Bachelor Degree in relevant subject	Chief Medical Technologist	Lecturer	Chief Medical Technologist/ Optical Maintain officer (Lab/RG/DT/ PT/RT/ Pharmacy)
2 nd	Instructor / Senior Med. Technologist (Lab/RG/DT/PT/RT/ Pharmacy)/Asstt. Bact eriologist/Asstt. Biochemist/Asst. Food Chem./ Asstt.Analyst.	By promotion from Junior Instructor to Instructor & from Medical Technologist to Senior Medical Technologist with 5 yrs experience OR Bachelor degree in relevant subject.	Senior. Medical Technologist)/As stt.Bacteriologist/ Asstt.Biochemist/ Asst. Food Chem./ Asstt. Analyst.	Instruct or	Senior Medical Technologist (Lab/RG/DT/ PT/RT/ Pharmacy)
3 rd	Med. Technologist/ Junior Instructor (Lab/RG/DT/PT/RT/P harmacy)	Diploma in Medical Technology. For Junior Instructor, with better academic background.	Medical Technologist	Junior Instruct or	Medical Technologist (Lab/RG/DT/ PT/RT/Pharmacy)

NB: Lab= Laboratory, RG = Radiography, DT= Dentistry, PT= Physiotherapy, RT=Radiotherapy

Table-III shows that the entry point in Medical Technology is diploma in the subject. Next step is the post of Instructor which is achieved after 5 years experience or after obtaining a bachelor degree in the relevant subject. Next post is the Lecturer or Chief Medical Technologist after attainment of 5 years experience or a bachelor degree. Next is the Superintendent from Chief Technologist, with 5 yrs experience OR M.Sc. in relevant subject. Finally Assistant Professor after 5 years and Professor after 3 years of experiences.

Discussion:

Inequitable distribution of doctors with high concentration in urban cities negatively affects the public health objective of Health for All. Thus it is one of the main concerns for most health policy makers, particularly in developing countries ⁶.

Maldistribution of human resources for health is a worldwide phenomenon and may appear in different dimensions. The first and greatest concern is inequitable distribution, particularly of professionals such as doctors. The concentration of doctors is usually highest in developed countries and cities, with better living standards, higher income, more social recognition and greater job satisfaction. The second form of mal distribution is in skill mix. Many countries, such as Bangladesh, Brazil, China and Pakistan, have more doctors than nurses. The third is the problem of over specialization. The fourth is institutional mal distribution. Last, there is gender mal distribution ⁷.

With the prevalent concept of dual authority in hospitals, doctors are still able to get their way to some extent at least as far as professional privileges are concerned but the same cannot be said about the nurses and the

paramedic staff. Most of them are over-worked and underpaid. As we see in the nurses in the neighbouring country India, mostly come from conservative lower middle class families. The cause may be the high attrition rate of nurses and paramedics in particular to the low satisfaction among all the employees in general⁸.

Training institutions and training receive a low priority. There is a generalized apathy towards training and capacity building. Training is not recognized as an intervention to improve performance. Owing to lack of nominations, training programmes are frequently cancelled. There is no proper planning and implementation of training programmes. Training is organized as thrust upon by the Central Government or donor agencies. Most of the programmes are lecture-based and didactic in nature. There is no focus on practical skills' development. The morale of trainers is also low. There is no career stream in training. There are no facilities for the regular professional development of trainers. Incompetent trainers and lack of technical guidance to training institutions has resulted in poor quality training. There are financial constraints as well. The payment of TA/DA to participants, procedures/facilities for inviting guest faculty and lack of funds for developing good quality training material are major problems. Only about 40% of registered nurses are active because of the small number of sanctioned posts, poor working conditions, low pay scales and migration, retirement or death. Nurses in a hospital setting spend most of their time in non-nursing tasks such as inventory control, record maintenance, etc. Training of most categories of paramedicals has also been unregulated. The quality of training of most of these categories of personnel is poor.

Crisis also prevails among the doctors. Availability of doctors, production of doctors, number of medical colleges, quality of training, requirement of teaching faculty for imparting training poses an important factor⁹.

Frontline health workers are the fastest growing segment of the health work force and are destined to increase under health reform. They account for about half of the health care workforce, and include community health workers, nursing assistants and technicians. Registered nurses are midlevel providers. Executives and senior management traditionally have paid less attention to the job satisfaction of these types of workers because they are thought to be easily replaceable and require a lower level of education. However, improving their job satisfaction could reduce turnover and lead to a better quality of care¹⁰.

Employees in a healthcare setting are expected to care for the overall well being of the patient and, hence, the HR department should take care of their emotional well being. Firstly, they have to be looked upon as not mere providers of health care but as normal human beings⁸.

Events to be Considered for developing, updating, finalizing & implementing Career plan-

- Career plan to be developed by proper integration of health, family planning and nutrition sector. Creating post of ADG (reproductive care & FP) and ADG (nutrition).
- Provision of going up from DG to become Secretary should be materialized.
- Minimum duration of service at each grade should be fixed up.
- Criteria for promotion from one grade to another grade to be fixed up as per recruitment rules.
- In case of promotion, posting working experiences should be taken in to consideration.
- Co-ordination between principals of MATS and the superintendents of the concerned attached hospitals of MATS should be ensured for effective teaching-learning of MATS students.
- For effective, smooth and speedy function from Grade 5 and upward each administrator and teaching staff should be supported by a secretary cum computer personnel.
- In case of promotion, persons working at feeder posts should be considered first.
- Principals of medical colleges and professors are at the same grade which should be taken in to consideration for smooth functioning of local administration.
- Co-ordination between principals of medical colleges and directors of hospitals of MCs should be taken in to consideration.
- After a certain level doctors should be promoted as per pillar considering academic performance & seniority.
- Provision of more bachelor degree for paramedics & gradually diploma should be eliminated.
- Doctors administrators & teachers should enjoy the status with all others benefits like admin cadre.
- Promotional opportunity should be created discipline wise and also in grade wise.

Conclusions:

Career plan to be developed by proper integration, coordination and collaboration among health, family planning, nursing and nutrition sectors.

Recommendations : More extensive work is needed involving health, family planning and nutrition sector to finalize the career plan for doctor's, nurses and paramedics, more active involvement of doctors, nurses and paramedics is essential to finalize the need based career plan for the country to ensure the categorical development.

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References:

1. *Successful Career Planning For Future Grads* by Deborah Veady, Associate Director of Career Planning at California State University, Long Beach: (www.fredonia.edu/cdo/c-c1.asp)
2. Dhaka study info: Dhaka Education Information
3. 10 Tips for Successful Career Planning: An Activity for Job-Seekers of All Ages. by *Randall S. Hansen, Ph.D.* (www.quintcareers.com/career_planning_tips.html)
4. Career Planning Tips-by ACT: (www.actstudent.org/career/tips.html)
5. Final Report of APW on "Drafting Updated Career Plan for Doctors, Nurses & Paramedics in Bangladesh, DGHS, CME & WHO: February- 2010, page,13-8.
6. Suwit W, Paichit P. Integrated strategies to tackle the inequitable distribution of doctors in Thailand: four decades of experience. <http://www.human-resources-health.com/content/1/1/12> visited on 27.2.2012.
7. Wibulpolprasert S: Human Resources for Health Development in the Context of Health Sector Reform. A training module for the Flagship training courses in Health Sector Reform. Washington DC: World Bank 1997.
8. Bhavna M. Managing Emotional Well-Being Of Employees & Its Significance In Healthcare. Posted at Youth Ki Awaaz on September 20, 2011 in Health & Life.
9. MATHUR S C, AVTAR S D, Financing and Delivery of Health Care Services in India. Human Resources for Health. Pp 153-168.
10. Workplace empowerment for front-line health workers creates higher job satisfaction.

A study on personal habits influencing the Oral Cancer patients

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Abstract

Oral cancer is a disorder involving the abnormal malignant tissue growth in the mouth. It is one of the most common cancer in Bangladesh. Bangladesh is a populated country. Among the large number of population¹ many of the peoples are affected by the oral cancer. Personal habits like Chewing Tobacco/ Smokeless Tobacco, Gull/Snuff are strongly associated with development of oral cancer. Other factors like poverty, over crowding, illiteracy, malnutrition & lack of awareness predispose to development of oral cancer.²

Study was done on personal habits of oral cancer patients in Radiotherapy Department of Dhaka Medical College & Hospital and Bangladesh Cancer Institute and Research Hospital from 1st March to 30 June 2001.

A total of 51 established oral cancer patients were included in the study, out of the respondents it was surprising to state that 96% had chewing habit and 67% habit by Leaf aracetum lime tobacco. From this study after assessing it may concluded that chewing habits like tobacco and gull are responsible for development of oral cancer.

(Bangladesh Dental Journal 2014; 30: 11-12)

Introduction:

Oral cancer is a global problem. It is one of most frequent and painful cause of death. It is the second killer in both developed and developing countries³. Personal habits like smokeless tobacco/chewing tobacco is a growing addiction found in many forms around the world. In south east countries consumed in betel quid or 'Pan', nowadays trend of chewing pre-packed powder ara-cenut with tobacco lime called Pan Masala.⁵

The most common site of the oral cancer involves mucous membrane of the oral cavity (Buccal mucosa), tongue, lips, floor of the mouth and palate. Most of oral cancer are squamous cell carcinoma, which are malignant and tend to spread rapidly.

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The good news is that there have been developed several newer approaches in cancer treatment such as gene therapy, cancer vaccines, immunotoxin therapy, antisense inhibition of gene expression, antiangiogenic therapy, radiation and chemotherapy protectors, intensity modulation of the radiation beam, fractionated (relocatable) stereotactic radiotherapy, and various new anticancer drugs. With advance of these newer approaches in cancer treatment, there will be cure sooner rather than later for many malignancies.

The most significant preventive measure used to prevent oral cancer is cessation of tobacco products. When a person stops using tobacco, the risk of developing oral cancer drops rapidly. In 10 years of tobacco use cessation, the risk is similar to an individual who has never smoked.

Quitting tobacco use is very difficult, since it develops addiction. This can be prevented by a few "QUITTING" AIDS have been found to help users. These aids decreases withdrawal symptoms and the craving for tobacco some examples are the nicotine patch, nicotine gum, nicotine inhaler, nicotine nasal spray.⁴

Objective:

To determine the relationship between personal habit and oral cancer.

Materials and Methods:

It was a descriptive type of cross sectional study was conducted 1st March to 30th June, 2001. Established Oral

Cancer patients attending at Radiotherapy Department of Dhaka Medical College Hospital & OPD of Bangladesh Cancer Institute and Research Hospital, Dhaka, was taken as study population. Sampling was done by simple purposive technique. Data collected by one interview schedule and check list was prepared to write the intra-oral examination findings. Data was collected from patients face to face using interview schedule. Collected data were checked, verified and compiled to maintain validity of contents of Data. For analysis data were compiled in a master sheet and analyzed by appropriate variables keeping in mind in the objective of the study. Simple calculation were done by scientific calculator. Finally analysis of data were presented in tables.

Results:

Cross sectional study on personal habits of oral cancer patients in Radiotherapy Department of Dhaka Medical College Hospital and OPD of Bangladesh Cancer Institute and Research Hospital.

Table-I

Distribution of Respondents by Chewing habit (tobacco) (n=51)

Chewing habit	No. of Respondent	% (Percent)
Yes	49	96
No	02	04
Total	51	100

It was surprising to state that 96% respondents had chewing habit and only 4% no chewing habit.

Table-II

Distribution of Respondents by Type of Chewing (n=51)

Chewing habit	No. of Respondent	% (Percent)
LALT	34	67
LAL	15	29
No Chewing	02	04
Total	51	100

Among 51 respondents, 67% had LALT, 29% LAT and 4% no chewing habit.

Table-III

Distribution of Respondents by use of Gull (n=51)

Use of Gull	No. of Respondent	% (Percent)
Yes	21	41
No	30	59
Total	51	100

According to the table, 59% did not use Gull and 41% had history of use Gull.

Table-IV

Distribution of Respondents by Duration of Gull used (n=51)

Duration of Gull used in years	No. of Respondent	% (Percent)
1-5 years	12	23
6-10 years	09	18
No duration of use	30	59
Total	51	100

Out of the respondents, 59% do not use Gull, 23% used Gull for 1-5 years and 18% used Gull for 6-10 years.

Discussion:

This is a cross sectional descriptive study conducted in the department of Radiotherapy of Dhaka Medical College Hospital & Bangladesh Cancer Institute and Research Hospital. A total 51 patients were interviewed by face to face with a interview schedule.

This study revealed that 96% respondents had chewing habit and among 96% patients were had habit LALT & 29% by LAL. While duration of habits, 20% patients had 11-15 years and 21% patients had 21-25 years of duration.

The study identified that 41% respondents had habit of gull with duration 1-10 years and 59% did not use gull. Therefore, use of gull is a risk factor and non-users of gull also had oral cancer.

Conclusion:

According to this study oral cancer has relationship with personal habits like chewing tobacco with betel nut and leaf, lime and use of gull strongly associated with causation of oral cancer.

It can be concluded that Dental Surgeons, Medical Doctors, Trained Technician and Health Professionals must acquire knowledge of biologic and epidemiological aspects of cancer in its prevention, early detection, diagnosis, treatment including the social and economic aspects of the disease.

References:

1. Mahboubi, E. The Epidemiology Oral Cavity Cancer out side of N.A. 40:1879-1889-1977.
2. Clayton-L Thomas Md. MPH, Tabers Cyclopedic Medicila Dictionary 1st Indias editin, Japee brothers (P-ltd), Edition-17 illustrated F.A Davis Company.
3. Huq S.F orientation of opinion Leaders-workshop, 96, Manual by Bangladesh cancer society, p-17.
4. Khadim M.L.: The effect of pan and its ingredients on oral mucosa JPMA-27:353-356, 1977.
5. Fact about oral cancer, A review by Dr. Greagg Bobier Cancer News on the Network (Internet).

A study on the effect of soft-lined dentures in edentulous patients

Haque MR¹, Osmani MSA², Kabir MH³, Islam S⁴

Abstract:

Objective: The objective of this study was to evaluate clinical efficacy of soft lined denture for the benefit of patients. **Materials and methods:** It was a prospective type of study carried out in the Department of Prosthodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka & Dhaka Dental College, Dhaka during the period of three years. A total 100 patients were taken in this prospective study. Ufi Gel P a silicone based soft-lining material have been tried in 50 patients. **Results:** In this study shows average age range were from 40-80 years. Male were 37 and female were 63. Percentage of changes indicated that the chewing efficiency increased 72%. In this study it has been found the average tissue healths of the patients were good. It was observed that initially 64% patients. At the one month follow up 52% had complaints of soreness of mucosa and following treatment the soreness of mucosa decreased to 90% at the end of 6 months. **Conclusion:** Denture quality was improved by application of Ufi Gel P soft liners and also markedly improved satisfaction and chewing efficiency. So, it is recommended to use Ufi Gel P soft lined dentures in removable prosthesis for the betterment of patients.

(*Bangladesh Dental Journal 2014; 30: 13-15*)

Introduction:

Soft lining materials may be defined as an elastic or viscoelastic materials applied to the fitting surface of a denture for the purpose of reducing and more evenly distributing occlusal loads on the underlying oral tissues. It is designed to act as a cushion between the hard denture base and soft tissues in order to reduce masticatory forces transmitted by Prostheses to the underlying tissues.¹ On the other hand, natural teeth are attached by a periodontal ligament to the bone of the jaw and masticatory loads successfully bypass the oral mucosa and are transmitted directly to the bone. Resilient liners may be regarded as analogues of the periodontal ligament and compressible healthy mucoperiosteum in denture and edentulous persons respectively.²

In the last decade soft –liners have been improved and new materials have become available. There are few published studies which have effectively tested the clinical performance of these liners and provide documentation about their serviceability.³

Some complete denture wearers suffer prolonged discomfort under their dentures despite all possible prosthetic adjustment. This may be due to poor patient tolerance, low pain threshold, a thin mucosa or irregular bony contour. Tissue underneath the lower denture usually receives more masticatory pressure per unit area than the upper. Resilient lining materials are mainly used for patients who can not tolerate these pressures.² The resilient liner acts as shock absorber and possess some degree of viscoelasticity, which reduces the effect of transmitted force to the basal seat of the denture.⁴

Materials and Methods:

The present study was a prospective type of study. The study was conducted in the department of prosthodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka. Study population included the patients attended in the department of prosthodontics for the treatment of the missing teeth as well as complaints of dentures. Total sample size was 50. Patients were selected randomly in this study. Patients attended with complete or partial missing of teeth or maxillofacial defect was initially selected. Patients followed by a history sheet mentioned in. Three years. Inclusion criteria are

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cooperative patient, complete missing teeth, partial missing teeth, maxillofacial defects. Exclusion criteria are non-cooperative patient, debilitated patients, patient who wants fixed prosthesis. Patients were recalled and followed up after 2 weeks, 4 weeks, 6 weeks and 6 months to observe the condition of their prosthesis. Patients feeling on to the prosthesis and clinical findings were recorded such demographic data comfort, chewing efficiency, esthetics, phonation, soreness of mucosa, retention, stability and looseness of denture in pre-designed data collection sheet. Data were analyzed by using computer based programme statistical package for social science (SPSS) for windows version 12. Each parameter was scored 1 for good, 2 for fair, 3 for poor.

Results:

Table-I

Demographic characteristics of study subject

Characteristics	Number	Percentage (%)
Age in years		
40-50	13	26
51-60	28	56
61-70	8	16
>70	1	2
Mean±SD	54.06±7.51	
Sex		
Male	20	40
Female	30	60

Table-II

Overall satisfaction in denture of the study patients

	Number	Percentage (%)
Excellent	25	50
Good	11	22
Fair	6	12
Poor	8	16
Total	50	100

Table-III

Ability of chewing food

	Number	Percentage (%)
Excellent	25	50
Good	10	20
Fair	7	14
Poor	8	16
Total	50	100

Table-IV

Comfort feeling of denture in study patients

	Number	Percentage (%)
Excellent	30	60
Good	9	18
Fair	6	12
Poor	5	10
Total	50	100

Discussion:

Soft liner materials are used for patients who are unable to tolerate a hard denture base because of advanced resorption of the residual alveolar ridge or due to the presence of a thin and relatively non-resilient mucosal. These materials are commonly proposed in instances whereby the clinician is dealing with fragile supporting tissue and where the patients comfort is of primary importance.⁵

In this study a total 50 number of patients. Their average age range were from 40-80 years. Male were 37 and female were 63. Treatment was taken more in female patient than male.

Regarding ability of chewing food after treatment, the ability of chewing food increased number of cases treated with soft line than hard based acrylic denture. Percentage of changes indicated that the chewing efficiency increased 72% in group. Because soft liner act as a shock absorber during mastication and reduces discomfort, soreness of tissue and increase retention and stability and also improve support of denture. Ergun and Hasan⁶ indicated that soft liner acts a shock absorber or cushion between denture base & alveolar bone.

In this study it has been found the average tissue healths of the patients were good. It was observed that initially 64% patients had soreness in mucosa. At the one month follow up 52% had complaints of soreness of mucosa and following treatment the soreness of mucosa decreased to 90% at the end of 6 months.

The problem of reduced tissue tolerance to denture is due to reduced denture surface area occurring with the bone loss of alveolar bone. Many patients experience pain and difficulty using dentures constructed with hard denture bases. The resilient materials have been used in the tissue surface of the denture to increase resilience during function and under pressure.⁷

William F et al.⁸ evaluated the soft resilient Molloplast-B most suitable for clinical use. The comprehensive evaluation of resilient denture liners reported by laney (1964) also pinpointed soft resilient Molloplast-B as the effective base for patient who exhibit dehydration, mucosal irritation, and bone loss.

Haris, in 1961 said, “If there were a material for cushioning dentures that would retain those soft, compatible properties as long as one year, most of chronic complaints in denture service would be eliminated”. Some believed that this had been attained in the use of silicone rubber.⁸

Makila¹⁰ observed 36 patients with Molloplast-B lined dentures for up-to 3 years. These patients were chosen because they had demonstrated that chronic soreness present under their conventional acrylic dentures. In their study 60% of the patient said that they were more comfortable with the soft lined dentures than previous acrylic resin dentures.

Conclusion:

Denture quality was improved by application of Ufi Gel P soft liners and also markedly improved satisfaction and chewing efficiency. Dentures offered comfort to a significant number of patients in this study who had a history of chronic discomfort with the wearing of conventional acrylic resin dentures. The problems of retention and stability in removable prosthesis can be also managed by using Ufi Gel P lined dentures. So, it is recommended to use Ufi Gel P soft lined dentures in removable prosthesis for the betterment of patients. Further studies with a large sample required to demonstrate this hypothesis tested in this study.

Reference:

1. Wright PS 1981, ‘Composition and Properties of Soft Lining materials for acrylic dentures’, ‘Journal of Dentistry’, vol. 9, no. 3, pp 210-223.
2. Kapur KK, Soman SD 1964, ‘Masticatory performance and efficiency in denture wearers’, J Prosthet Dent vol. 14, pp 687-694. .pp 140-150.
3. McCord JF, Smith P, Grey N 2000, ‘Treatment of Edentulous Patients’, Churchill Livingstone Publishing Co UK .
4. Craign RG, John M 1999, ‘Powers’, in: Restorative Dental Materials”, 11th edition, Mosby Inc, USA pp 312-332.
5. Muruta H (2002) examined dentures lined by silicone, soft refining material and found improved masticatory function. They suggest that the use of materials with higher ‘ten delta and G’ provides the most optimum masticatory function.
6. Ergun Aydinlik, Hasan U, Akay 1980, ‘Effect of a resilient layer in a removable partial denture base on stress distribution to the mandible’, ‘The Journal of prosthetic dentistry’, vol. 44, no. 1, pp 17-20.
7. Perry W, Bascom 1966, ‘Resilient Denture Base Materials’, ‘Journal of Prosthetic Dentistry’ vol. 16, no. 4, pp 646-649.
8. William F, Schmidt Jr., Dale E, Smith 1983, ‘A six-year retrospective study of Molloplast B Lined dentures Part- II : liner serviceability’, ‘The Journal of Prosthetic dentistry’, vol. 50, no. 4, pp 459-465.
9. Julian B, Woelfel, George C, Paffenbarger 1968, ‘Evaluation of complete dentures lined with resilient silicone rubber’ ‘Journal of American Dental Association’ vol. 76, no. 18, pp 582-590.
10. Makila (1979) followed up 18 patients with soft lined denture for up-to 3 years. These patients had previous chronic tissue soreness with conventional acrylic resin dentures. Two weeks after insertion the situation were better than before with soft lining in all patient.

Attitudes of edentulous patients towards replacement of missing teeth at Dhaka Dental College Hospital

Nahar F¹, Hossain MA², Munira M³, Azam MG⁴

Abstract:

This cross-sectional study was conducted among 240 patients to assess attitudes towards replacement of missing teeth among edentulous patients aged 18-77 years who reported to the department of prosthodontics of Dhaka Dental College Hospital. Answers to a 12-item close ended questionnaire regarding teeth replacement were recorded. It was followed by clinical assessment in which the chief complaints were recorded, and existing and missing teeth were charted. Eighty five percent of patients were partially edentulous and remaining 15% were completely edentulous. About 28% of patients were in forty-eight to fifty-seven years age group, followed by 20% in the thirty eight to forty-seven years age group. Majority of male patients reported that improvement of function was the main reason for tooth replacement while in females aesthetic reason was on the top. Around 62% of patients who had lost teeth only in anterior segment needed tooth replacement for aesthetic reason: 81% of patients who had lost teeth only in posterior segment needed tooth replacement for mastication. A low felt need was the most common reason, while financial constraint was next reason for delaying in tooth replacement. The study reveals that gap exists in awareness of patients regarding other functions of teeth like esthetic and speech. The results of the present study may be helpful as a baseline for further assessment of attitudes of edentulous patients towards replacement of missing teeth.

(Bangladesh Dental Journal 2014; 30: 16-18)

Introduction:

Mouth is the gate way of health. Teeth have a very important role in the maintenance of quality of life. There is no doubt that tooth loss affects the appearance of a person.¹ Tooth loss is psychologically a very traumatizing and upsetting experience, and is considered to be a serious event in the life of a person, which requires significant social and psychological readjustment.^{2, 3} Patients seek dental treatment for both functional and esthetics or cosmetic reasons, and dentists have been successful in restoring or improving many a patient's appearance.²

Although it is true that almost all edentulous patients who consult a dental surgeon want to replace missing teeth, it must not be assumed that they are all equally willing to take their part in making dentures successful for

replacement of teeth. An attitude of mind will have been formed by the patient's own past experience of dentures, if any, or from his observation of friends or relatives who wear dentures.⁴

Studies have shown that a patient's attitude & level of expectation can profoundly influence the treatment outcome. Complete denture failure can result from a misunderstanding between the dentist and patient. Patients in one study reported that after selection, the most important characteristic of the dentist is his or her willingness to discuss the patient's dental problems. In order to open a line of communication with the patient, the dentist must be able to assess the patient's overall "prosthetic attitude". This does not imply that a dentist should attempt psychoanalyze suspect patients. These patients should be referred to a clinical psychologist or psychiatrist for proper diagnosis and treatment. The dentist should, however, be able to identify negative and positive responses which can influence treatment outcome.⁵

Patients' attitudes towards dentures, measured by means of a questionnaire prior to the patients' receiving new dentures could be a prospective tool to determine satisfaction with new dentures⁶. In Bangladesh, the attitudes of patients' towards replacement of missing teeth has not been investigated as much as in western countries.

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Therefore the purpose of this study was to carry out a clinical survey to assess attitudes towards replacement of missing teeth among edentulous patients aged 18-77 years who reported to the department of prosthodontics of Dhaka Dental College Hospital.

Materials and Methods:

A cross-sectional study was conducted among 240 patients seen at the prosthodontics department of Dhaka Dental college Hospital during February, 2010 to November, 2010. All patients aged 18-77 years with at least one missing tooth (excluding third molars) were included. Subjects were informed of the nature of the study and their consent was obtained.

Answers to a 12-item close ended questionnaire were recorded. The questionnaire included questions regarding reasons for tooth replacement, reasons for delay in seeking treatment for tooth replacement, reasons for tooth replacement according to the segment in which tooth was lost. The questionnaire was followed by a clinical examination in which the chief complaints were recorded, existing and missing teeth were charted. Missing teeth were categorized as anterior and posterior to make distinction between esthetic and functional needs. A single trained investigator recorded answers from the respondents followed by a clinical examination. Collected data were analyzed by using statistical software (SPSS, version 17).

Results:

This cross-sectional study was carried out among 240 patients, out of which 46.66% were males and 53.33% were females: 36 patients were completely edentulous, 204 patients were partially edentulous (Table-1).

Table-I
Distribution of patients according to gender and dentition status

Characteristics	Number of patients	% of patients
Male	112	46.66
Female	128	53.34
Completely edentulous	36	15.00
Partially edentulous	204	85.00

About 28% of patients were in forty-eight to fifty-seven years age group, followed by 20% in the thirty eight to forty-seven years age group (Table-II).

Table-II

Distribution of patients according to age (in years)

Characteristics	Number of patients	% of patients
18-27	31	12.92
28-37	24	10.00
38-47	48	20.00
48-57	68	28.33
58-67	44	18.33
68-77	25	10.42

Majority of the male patients reported that improvement of function was the main reason for tooth replacement while in females aesthetic reason was on the top (Table-III).

Table-III

Distribution of patients according to reasons for tooth replacement in male & female

Characteristics	Number of Patients		Frequency	
	Male	Female	Male	Female
Appearance	10	29	25.00	75.00
Function	48	32	68.00	32.00
Combination	54	67	44.16	55.84

Around 62% of patients who had lost teeth only in anterior segment needed tooth replacement for aesthetic reason: 81% of patients who had lost teeth only in posterior segment needed tooth replacement for mastication, while 55% patients who had lost teeth in both anterior and posterior segment (Table-IV).

Table-IV

Distribution of patients according to the segment in which tooth was lost and reason for tooth replacement

Reason for Tooth Replacement	Anterior (%)	Posterior (%)	Combination (%)	Total (%)
Aesthetic	13(61.90)	0(0.00)	6(3.30)	19(7.92)
Speech	0(0.0)	1(2.70)	1(0.55)	2(0.83)
Function	1(4.76)	30(81.08)	101(55.50)	132(55.00)
Combination	7(33.33)	6(16.21)	74(40.65)	87(36.25)
Total	21	37	182	240

A low felt need was the most common reason, while financial constraint being next for delaying in tooth replacement. Four percent patients were on post-extraction healing period (Table V).

Table-V
Reasons for delay in tooth replacement

Reasons for delay	No. of Patients	Frequency (%)
Time Constraint	54	22.50
Financial	66	27.50
Low felt need	84	35.00
Lack of knowledge	26	10.84
Post-extraction healing period	10	4.16

Discussion:

In Bangladesh, Epidemiological information on patient's attitude towards missing teeth replacement is not adequate. This study was conducted in an attempt to explore the attitudes towards replacement of missing teeth among the patients attending out-patients department of Dhaka Dental College Hospital.

Most of the patients in this study belonged to fifty-eight to sixty-seven years of age group. Geriatric patients pay less attention in dental care, which is reflected by fewer patients in >65 years of age group. Mobility problems, more priority in medical than dental care, misconceptions about value of dental visits –all have been described as contributing factors to this seemingly disinterest in seeking dental care among geriatric patients.⁷

As the patients of this study had reported to the OPD, on their own, it was reasonably understandable that all the subjects had expressed that missing teeth had to be replaced. This finding was in contrast to that of Akeel who found that about 82% of the subjects had perceived a need for replacement of teeth.⁸ The difference may be due to the fact that the subjects in that study were selected from a screening clinic. A low felt need was the most frequently mentioned reason for not replacing teeth and is in agreement with the findings of Faiza and Salman⁹. Osterberg et al. reported that individual's decision for replacing missing teeth was determined mainly by esthetic rather than functional factors.¹⁰ Position of missing teeth plays an important role in the demand for replacement of missing teeth.

In this study, aesthetic was the main reason for tooth replacement in those who had lost teeth only in the anterior segment; who had lost teeth only in the posterior segment needed tooth replacement for mastication; and who had lost teeth in both (anterior and posterior) segments needed tooth replacement for mastication. In Bangladesh, many people are aware of only masticatory function of teeth. Aesthetic and speech as functions of teeth are less

perceived by them. As tooth loss occurs usually over a period of time, people get adapted to situation with less discomfort. This is why many older people usually do not perceive a need for dentures even when they lose a significant numbers of teeth.¹¹

Conclusion:

The study reveals that gap exists in awareness of patients regarding other functions of teeth like esthetic and speech. The results of the present study may be helpful as a baseline for further assessment of attitudes of edentulous patients towards replacement of teeth. This gap should be fulfilled through educating the patients and thereby improving patients' compliance with acceptance of prosthesis.

References:

- Zarb GA. Biomechanics of the edentulous state. Zarb GA, Bolender CL, Eckert S, et al (eds). *Prosthodontic Treatment for Edentulous Patients*, 12th ed. St. Louis: Mosby; 2004: 22
- Omar R, Tashkandi E, Abdul jabbar T, Abdullah MA, Akeel RF. Sentiments expressed in relation to tooth loss: A qualitative study among edentulous Saudis. *Int J Prosthodont* 2003; 16: 515-20
- Fiske J, Davis DM, Francis C, Gilbier S. The emotional effects of tooth loss of edentulous people. *Br Dent J* 1998; 184: 90-3
- Macgregor AR. Taking a history and examining the mouth. Fenn, Liddelow and Glimson's *Clinical Dental Prosthesis*. Butterworth & Co, 3rd edn: 1989, 25
- DeFranco RL, Ortman LF. Diagnosis and Treatment Planning. In: Winkler S. *Textbook of Essentials of Complete Denture Prosthodontics*. Ishiyaku EuroAmerica Inc. U.S.A. 3rd ed. 2000;4: 45
- Van Waas MAJ. Determinants of dissatisfaction with dentures: a multiple regression analysis. *J Prosthet Dent* 1990;64: 569-72
- Maupome G, MacEntee MI. Prosthodontics profiles relating to economic status, social network, and social support in an elderly population living independently in Canada. *J Prosthet Dent* 1998; 80:598-604.
- Akeel R. Attitudes of Saudi male patients towards the replacement of teeth. *J Prosthet Dent* 2000;90:571-7
- Faiza A, Salman A. Trends, awareness, and attitudes of patients towards replacement of missing teeth at university college of dentistry. *Pak Oral and Dent J* 2014;34(1):190-3
- Osterberg et al. Variation in dental health in 70-year old men and women in Goteberg, Sweden: a cross-sectional epidemiological study in longitudinal and cohort effects. *Swed Dent J* 1984; 8: 29-48
- Pallegedara C, Ekanayake L. Tooth loss, the wearing of denture, and associated factors in srilankan older individuals. *Gerodontology* 2005;22:193-9

Calcium Hydroxide as an intra canal medicament in infected root canal

Aich SK

Abstract:

This descriptive type of study on "Calcium hydroxide as an intra canal medicament in infected root canal" among the patients attending Department of Conservative dentistry and Endodontics, Faculty of Dentistry, BSMMU. The study was carried out from 1st January 2002 to 31st December 2003. Data were collected with a questionnaire and a checklist. The sample comprise 52 respondents. Among them 30 were male and 22 were female. Age variation was between 11 to 60 years. All respondents having alveolar abscess, out of them 35 were with acute alveolar abscess and rest were with chronic alveolar abscess. Most of the respondents' age were between 11-30 years. The maxillary central incisors and mandibular first molar were most common teeth having alveolar abscess. The most common aetiology of alveolar abscess were dental caries and trauma. As a result of this study it can be concluded that calcium hydroxide is an effective intra canal medicament in treatment of infected root canal.

(Bangladesh Dental Journal 2014; 30: 19-22)

Introduction:

The use of calcium hydroxide in endodontics was introduced by Herman 1920¹. Although well documented for this time, the clinical application during the following 25 years were well known². Calcium hydroxide can be categorized as conventional antiseptic, but it does kill bacteria in root canal space. It has been routinely used by many endodontic by last 40 years. The value of calcium hydroxide in endodontic treatment of necrotic infected teeth is now well documented^{3,4}. Calcium hydroxide normally used as a slurry of calcium hydroxide in a water base. At body temperature, less than 0.2% of calcium hydroxide is dissolved into Ca⁺ and OH⁻ ions. Calcium hydroxide needs water to dissolve. Therefore it is most advantageous to use water as the vehicle for the calcium hydroxide paste. In contact with air calcium hydroxide forms calcium carbonate. This is an extremely slow process, however, and of little clinical significance⁴.

Calcium hydroxide is a white, odorless powder, which when mixed with water or glycerine produce alkaline medium as high as p^H 12.5. Calcium hydroxide should be stored in tightly closed and sealed bottles. Some spore forming bacteria also flourish in alkaline medium present in calcium hydroxide and contaminate it. Hence, preferably every time fresh and properly sealed calcium hydroxide should be used and rest should be discarded⁵.

Calcium hydroxide has definite characteristic of producing calcium concentration resulting in less leakage at the

capillary junction. It causes contraction of the pre-capillary sprinters, thus in resulting less plasma outflow. This could account for the clinical use of the material in controlling periapical exudation. Calcium hydroxide has been successfully used by some clinicians in treating teeth with periapical granuloma, abscess and cyst. Perhaps the locally destructive action of calcium hydroxide with the high p^H results in chemical cautery and is responsible for the breakdown of the epithelium. Many workers are of the opinion that if the concentration of the ions increased locally, the phosphatase enzyme in presence of calcium salt can accelerate bone formation. Khatavkar and Talim⁶ carried out a study to evaluate the periapical healing following treatment with prednisolone calcium hydroxide. They concluded that calcium hydroxide is the one of the most suitable materials available at present for the treatment of several difficult pathological situations associated with pulpless teeth⁷.

Calcium hydroxide is a slowly acting antiseptic. Direct contact experiments in vitro require a 24 hours contact period for complete kill of enterococci⁸. In clinical experimentation, one week of intra canal dressing has been shown to safely disinfect a root canal system⁴. In addition to killing the bacteria, calcium hydroxide has an extraordinary quality in its ability to hydrolyze the lipid moiety of bacterial lipopolysaccharides, thereby inactivating the biological activity of lipopolysaccharide^{9,10}. This is a very desirable effect because dead cell wall material remains after killing of bacteria that causes the root canal infection. Calcium hydroxide not only kills the bacteria, but it also reduce the effect of the remaining cell wall material

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Disinfection of the root canal is very important phase of root canal treatment. Microorganisms present in the root canal can invade the periapical tissue and may not only give rise to pain, but also destroy the periodontium including alveolar bone¹¹.

The three main procedures to reduce the microorganisms from infected root canal. These are Biomechanical preparation, Irrigation of root canal, Intra canal medication. Several study have shown that intra canal medication reduces or eliminates microbial flora from the root canal. Bystrom and sundqvist¹² observed that when no intra canal medicament was used between appointments, in most of the cases pathogenic organism were increased in numbers. Therefore, the need of an intra canal medicament to destroy or reduce the number of microorganisms seems apparent.

Calcium hydroxide is effective in the treatment of infected root canals. Its high p^H has strong antibacterial potential. In direct contact with calcium hydroxide, 99.99 percent of bacteria usually present in the infected root canal become bacteria free within 1 to 4 weeks after dressing with calcium hydroxide. Calcium hydroxide also has a capacity to dissolve the necrotic remnants, which act as potential substrates for bacterial growth¹⁴.

On the other hand, caustic intra canal medicaments such as paraformaldehyde will not only fail to produce sterilization but may also percolate into the periradicular tissues and damage vital healthy tissues, thus delaying healing¹⁵.

Materials and methods:

This prospective study was carried out among the selected patients in the Department of Conservative Dentistry and Endodontics, Faculty of Dentistry, BSMMU. The study was conducted for the period of two years from January 2002 to December 2003. The study population was comprised of patients having infected root canal, irrespective of age sex and tooth number. Initial sample size was 52 patients with infected root canal requiring endodontic treatment.

Inclusion criteria: Patients with infected root canal (acute or chronic alveolar abscess).

Exclusion criteria: Patients with irreversible pulpitis or other patient required endodontic treatment.

Keeping in mind, the study objectives, a draft data collection sheet was prepared in conclusion with the respected guide. It was an interview schedule and an observational checklist, which was a structured one to minimize time. All the variables were considered

accordingly. The first portion of the interview scheduled in a form of relevant information and some variable and last portion was checklist to note the findings on examination.

Study procedure:

After proper selection of the cases on the basis of the above mentioned criteria, root canal treatment was performed in conventional technique. Disinfection of the operative field and proper sterilization of the instruments ensured. Isolation of the tooth was done with rubber dam, cotton roll and the use of the saliva ejector. All instruments and material were sterile and in a aseptic manner. Hand gloves, facemask and eye protector were used in every case. Preparation of the access cavity was done by opening the pulp chamber and by removal of pulpal wall. Free access to all root canals along straight line were secured by gentle removal of all contents of the pulp chamber. Gentle irrigation was done with 5.25% Naocl solution to remove the necrosed dentine. Excavation of the necrosed tissue was done with sharp excavator or slow rotating round bur. Location of the canal orifice obtained with explorer and 5.25% sodium hypochlorite solution was applied to pulp chamber. All root canal instruments were fitted with instrument stop to prevent injury of periapical tissue by over instrumentation.

With the help of preoperative radiograph, approximate length of the root canal was obtained. Before bio-mechanical preparation of the canal, a diagnostic radiograph was taken for every case to calculate the exact root canal length. Bio-mechanical preparation of the root canal was done with accurate length, diameter and number reamer, K-file and H-file. Widening of the canal was done by gradual increasing uses of the files after flooding the canal to prepare it for obturation. Removal of the dentin and organic debris from the canal was done by irrigation alternately with sodium hypochlorite and normal saline. Drying of the root canal was done with absorbent paper points. As a root canal dressing slurry mix of calcium hydroxide paste was used in some cases more than one (two or three) dressing of calcium hydroxide was required. All cases were treated in multiple appointments. Root canal sealer zinc oxide eugenol was used in the canal with a hand reamer. Master cone gutta-percha point was selected and obtained in the canal according to the diameter of the canal. A spreader was used to create lateral space for condensation with multiple gutta-percha points to obtain hermetic sealing of the root canals. Immediate post operative follow-up was done after root canal obturation. A follow-up sheet was maintained for the record of response of the patient in every case.

Results:

After collection of the data were analyzed according to the variables for the purpose of the study . The results have been shown in tabular forms.

Table-I
Distribution of the patients by sex.(n=52)

Sex	Number	Percentage
Male	30	57.70
Female	22	42.30

Table-I shows that out of 52 respondents 30(57.70%) were male and 22(42.30%) were female.

Table-II
Distribution of the patients by type of infection.(n=52)

Type of alveolar abscess	Number	Percentage
Acute	35	67.30
Chronic	17	32.70

Table-II shows that out of 52 respondents 35(67.30%) had Acute and 17(32.70%) had chronic infection.

Table-III
Distribution of the patients by age group.(n=52)

Years	Number	Percentage
11-20 yrs	17	32.7
21-30 yrs	15	28.8
31-40 yrs	13	25.0
41-50 yrs	05	9.7
51-60 yrs	02	3.8

Table-III shows that out of 52 patients age range was 11 to 60 years. Among then 17(32.7%) patients were in age group of 11-20 years, 15(28.8%) patients were in age group of 21-30 years, 13(25%) patients were in age group of 31-40 years, 5(9.7%) patients were in the age group of 41-50 years and 2(3.8%) patients were in age group of 51-60 years.

Table-IV
Distribution of the patients by tooth number.(n=52)

Tooth	Maxillary		Mandibular	
	No.	(%)	No.	(%)
Central Incisor	14	(26.90)	04	(7.70)
Lateral Incisor	05	(9.60)	01	(1.92)
Canine	02	(3.85)	01	(1.92)
First Premolar	02	(3.85)	02	(3.85)
Second Premolar	01	(1.92)	01	(1.92)
First Molar	04	(7.70)	12	(23.10)
Second Molar	01	(1.92)	02	(3.85)
Third Molar	0	(0)	0	(0)
Deciduous	0	(0)	0	(0)

Table-IV shows that 14(26.90%) teeth were maxillary central incisors, 12(23.10%) were mandibular first molar, 01(1.92%) was second premolar, 2(3.85%) were maxillary canine. Third molar and deciduous tooth were not in the study.

Table-V
Distribution of the patients by Aetiology.(n=52)

Aetiology	Number	Percentage
Cariou exposure	29	55.75
Trauma	13	25.00
Others	10	19.25

Table-V shows that 29(55.75%) of aetiology was dental caries and 13(25%) was trauma.

Discussion:

Residual microorganisms left in the root canal system following cleaning and shaping or microbial contamination of a root canal system between appointments have been a concern. If root canal treatment is not completed in a single appointment, antimicrobial agent are recommended for intra canal antiseptics to prevent the growth of microorganism between appointments. The access opening in the tooth must also be sealed with an effective inter appointment filling to prevent the microbial contamination by microleakage from the oral cavity. Despite the controversy over culturing root canals, most clinicians agree that healing is more likely in absence of bacteria³. A recent study used modern microbiologic techniques ,with tooth root-filled at a single a appointment and evaluated for clinical success. Initially all 55 single rooted teeth were infected. After instrumentation and irrigation with 0.5% sodium hypochlorite, bacteria still could be cultivated from 22 of the 55 root canals². Periapical healing was followed for up to 5 years. Complete healing occurred in 94% of those teeth that had negative culture but only 68% of those with positive culture at the time of root canal obturation. These finding suggest the importance of elimination bacteria from the root canal system before obturation. In the past, numerous antimicrobial agents have been used that were antigenic and cytotoxic and provided relatively short term antiseptics.

These include traditional phenolic and fixative agents such as camphorated monochlorophenol, formocresol, eugenol, metacresylacetate and halides (iodine-potassium iodide). A reliance on mechanical instrumentation and aversion to the use of cytotoxic chemicals had lead to a lac of use of an intra canal dressing by many clinicians, a practice that allows remaining bacteria to multiply between appointments.

The current intra canal dressing of choice is calcium hydroxide. Although not categorized as an antiseptic, studies have shown calcium hydroxide to be an effective antimicrobial agent¹. Other studies have shown it is to be an effective inter appointment dressing over several weeks. When mixed into a paste with water, calcium hydroxide's solubility is less than 0.2%, with a pH of about 12.5. Some of its antimicrobial activities may be related to the absorption of the carbon dioxide that starves capnophilic bacteria in root canal. The Saunders group in Dundee was disappointed, however, in the lack of antimicrobial activity of calcium hydroxide against the anaerobes⁴.

On the other hand calcium hydroxide has been shown to hydrolyze the lipid moiety of bacterial lipopolysaccharides, making them incapable of producing such biological effects as toxicity, pyrogenicity, macrophage activation and complement activation. Lipopolysaccharides have been shown to be present in the dentinal tubules of infected root canals⁵.

Obliterating the canal space with calcium hydroxide during treatment may minimize the ingress of tissue fluid used as nutrient by microorganism. Removal of the smear layer facilitates the diffusion of calcium hydroxide into dentinal tubules⁶. But smear layer or not, a Brazilian group was disappointed in the inability of calcium hydroxide to destroy in the infected dentinal tubules, whereas four root canal sealers appeared to be quite effective against tubular bacteria, AH26 being the best. Moreover, zinc oxide-eugenol sealer was found to be more effective in inhibiting the growth of *Streptococcus anginosus* than that of calcium hydroxide containing sealer. *Actinomyces israelii*, a species of bacteria isolated from periapical tissues, has been reported to not respond to conventional endodontic therapy⁷.

Conclusion:

As a result of this study, it can be concluded that calcium hydroxide is an effective intra canal medicament in case of infected root canal specially for exudation control and management of inter appointment pain. However, additional information is needed to more accurately predict the

outcome of this treatment. A study in which multifactorial analysis could be performed would be extremely valuable.

References :

1. Herman BW: Calciumhydroxide als mittel zum behandel und fillen von zahnwurzelkanalen, Wurzbuing, Med, Diss. V. German dissertation 1920.
2. Herman BW: Dentin obliteration der wurzelkanale nach behandlung mit calcium, Zahnartze Rundschau 1930;39:888.
3. Bystrom A, Claesson r, Sundqvist G: The antimicrobial effects of camphorated paramonochlorophenol, camphorated phenol, calcium hydroxide in the treatment of infected root canals, emdod Dent Trai, matol 1985;1:170.
4. Sjogren u, Figdor d, Spangberg L, Sundqvist G: The antimicrobial effect of calcium hydroxide as a short term intra canal dresssing, int Endod J 1991;24:119.
5. Safavi KE, Spangberg I, Langeland K: Root canal dentinal tubule disinfection, J Endod 1990;16:207.
6. Kavatker Talim: A review of calcium hydroxide: Int Endod J 1990;23:283-97.
7. Safavi KE, Nichols FC: Effect of calcium hydroxide on bacterial lipopolysaccharide, J Endod 1993;19:76.
8. Safavi KE, Nichols FC: Alternation of biological properties of bacterial lipopolysaccharide, J Endod 1993;19:76.
9. Agarwal Sk, Singh H, Saimbi CS, Chandra Satish: Clinicobacteriological assessment different antimicrobial agents in sterilization of root canal JID 1982;54.
10. Chandra S, Calcium hydroxide almost a panacea for the endodontic problems. In parameswaran a and Karthikeyan KS (Eds): Recent advance in Operative Dentistry, Federation of Operative dentistry India 1985;53-60.
11. Cameron JA: The Choice of irritant during hand instrumentation and ultrasonic irrigation of the root canal: A scanning electro microscope study, Austra Dent. J 1995;40(2):85-90.
12. Jain A, Chandra S et al: Effects of various root canal irrigants on the adaptation of root canal sealer in permanent teeth a SEM Study Endodontology 1999;25:3.
13. Jeeraphat J, Stuart GD, Harold HM: Effect of matrix placement on furcation perforation repair. JOE 1999;25:3.
14. Holland R, Alexandre AC, Murata SS et al: Apical leakage following root canal dressing with calcium hydroxide EDT 1995;11(6):261-263.
15. Tani-Ishi-n, Wang CY, Tanner A et al, Challenge in root canal microbiota during the development or rat periapical lesion. J oral, micro & immunology 1994;9:129-135.

Relationship between smoking and smokeless tobacco with Oral squamous cell carcinoma

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Abstract:

The aim of study was to assess the relationship between smoking and smokeless tobacco with oral squamous cell carcinoma. Forty five male and 55 female patients aged 31 years and above 71 years having oral squamous cell carcinoma. Both male and female of 41 - 50 years age group were more affected and buccal mucosa was predominant (45.6%) site of involvement. Forty out of 45 male patients and 54 out of 55 female patients had the habit of smokeless tobacco use. Twenty three out of 45 males were smokers and no female were smoker. Data regarding the size, presentation of the lesion, clinical staging and histological grading was obtained by clinical examination and relevant investigation. The use of smokeless tobacco by females was found significant for the development of Oral Squamous Cell Carcinoma. The study indicated strong association between development of squamous cell carcinoma and tobacco consumption, specially in the smokeless form.

(Bangladesh Dental Journal 2014; 30: 23-29)

Introduction:

Cancer is one of the most common causes of morbidity and mortality today. The global burden of cancer continues to increase mostly because of increasing adoption of cancer causing behaviors particularly smoking and smokeless tobacco forms in developing countries¹.

Oral squamous cell carcinoma is malignant epithelial neoplasm affecting the oral cavity with a half million new cases diagnosed per year². Oral squamous cell carcinoma has one of the highest recorded incidences in developing countries, comprising 20 - 30% of all neoplasms³. Oral tobacco has long been referred to as a major contributor to oral cancer incidence. The overall mortality rate for oral cancer remains high at approximately 50% even with modern medical services⁴.

According to International Agency for Research on Cancer (IARC) smoking of tobacco is practiced

worldwide by over one thousand million people (IARC, 83). Tobacco is used in a number of forms in South Asia⁵. About half of Bangladeshi men and one fifth of women use tobacco in either smoking or in a smokeless form and the awareness about its harmful effects is low⁶. Smoking Cigarettes and Biris (Beedi) are common habits among the general male population in Bangladesh (Choudhury *et al.*, 2007). Tobacco is used in a number of forms in South Asia⁵. The prevalence of at least one form of tobacco in Bangladesh ranged between 33.4% and 41%⁷. The overall prevalence of smoking, chewing tobacco and gul usage was 20.5%, 20.6% and 1.8% respectively⁸.

Oral use of smokeless tobacco is practiced worldwide in many forms⁹. In developing countries in Southeast Asia and Pacific Rim the habit of tobacco chewing is usually associated with the use of areca nut, which may have a synergistic effect on the development of cancerous and precancerous lesion. A number of studies have characterized smokeless tobacco (ST) as an etiological factor in the development of cancer of the oral cavity and the esophagus⁹. A Swedish study showed that snuff dipping (snuff dipping) increased the risk of oral cancer by 5 to 6 fold⁹.

Tobacco is usually consumed as smokeless and smoking form. Smokeless tobacco is not a homogeneous category, Smokeless tobacco exists in two major forms. (1) Snuff and (2) Chewing tobacco. Snuff may be moist & dry. Moist snuff is very popular in Sweden, where it is called snus. Dry snuff is a fermented, fired cured tobacco & pulverized into powder & its original use was through nasal inhalation

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(Rodu and Jansson, 2004). Moist snuff consists of fire- and air- cured dark tobaccos that are finally cut & fermented which is the most popular form in the U S and Sales of this has increased by 77% over a period of 15 years (Federal Trade Commission, 2001).

The betel quid is usually known as “paan” in this sub continent which is a package form from the leaf of the piper betel plant. Paan is taken along with other ingredients including slices of areca nut, slaked lime (calcium hydroxide), tobacco, spices and a variety of ingredients depending on availability, geographical location and ceremonial occasion. The package is folded into a triangular quid and chewed and sometimes even swallowed. People are habituated with smokeless tobacco combined with betel leaf (paan), sliced areca nut, areca catechu, and / or powdered slaked lime; and with smoking tobacco as cigarette, biri (beedi), tobacco pipe, hukka and reverse smoking.

Materials and method:

01. Type of study

Cross sectional study.

02. Period of study

The study was carried out from July 2012 to June 2014.

03. Study place

The study was conducted in the Department of Oral and Maxillofacial Surgery, Dhaka Dental College and Hospital, Dhaka.

04. Summary of methodology

Data were collected for a definite period by structured questionnaire with consent and convenience of the subjects. A data collection sheet, including questionnaire and checklist, was designed to obtain information about

age, sex, income group, history of tobacco use, site, size, presentation, duration and histologic grade of the lesion etc. Data regarding the size, presentation of the lesion, clinical staging and histological grading was obtained by clinical examination and relevant investigation.

05. Data Processing and Analysis

Data was compiled and was analyzed using Statistical Package for Social Science (SPSS) version 17 where mean and standard deviation was used for continuous data and frequency table for categorized data. χ^2 test along with

association between smokeless and smoking tobacco habit with TNM staging of lesion and size of lesion and practice using for p-value was analyzed.

06. Ethical Issues

- Ethical clearance was taken from the “Ethical Committee” of Dhaka Dental College.
- Patient and / or attendant was explained about the procedure and outcome of the research in details and informed written consent was obtained.
- Confidentiality of the respondents was strictly maintained.

Results:

This chapter presents the findings of the study obtained from analysis and interpretation of the data. This cross-sectional study was conducted to assess the relationship between smoking & smokeless tobacco with Oral Squamous Cell Carcinoma (OSCC) among the respondents who were diagnosed irrespective of age and sex, and fulfilling the basic requirements of inclusion and exclusion criteria. Data were collected by administering a questionnaire on 100 respondents. Data were analyzed by SPSS version 17. The overall results of the study are presented in tabular and narrative form.

Table-I
Distribution of the respondents by Age group (n=100)

Age of respondents(In years)	Male		Female		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
31 - 40 years	8	17.8	14	25.5	22	22.0
41 - 50 years	18	40.0	24	43.6	42	42.0
51 - 60 years	8	17.8	12	21.8	20	20.0
61 - 70 years	9	20.0	5	9.1	14	14.0
71 + years	2	4.4	-	-	2	2.0
Total	45	100.0	55	100.0	100	100.0
Mean Age	51.91 ± 11.94		48.98 ± 9.40		50.30 ± 10.67	

Table-II
Distribution of the male and female respondents by site of lesion (n=100)

Site of the lesion	Male		Female		Total	
	N	%	N	%	N	%
Lip	1	1.4	1	1.2	2	1.3
Tongue	4	5.5	3	3.5	7	4.4
Floor of the mouth	1	1.4	2	2.4	3	1.9
Buccal mucosa	30	41.1	42	49.4	72	45.6
Alveolar mucosa and gingival	7	9.6	9	10.6	16	10.1
Buccal sulcus	14	19.2	12	14.1	26	16.5
Retromolar trigone	12	16.4	13	15.3	25	15.8
Hard Palate	4	5.5	1	1.2	5	3.2
Soft Palate	-	-	2	2.4	2	1.3
Total	73	100	85	100	159	100

* Total number does not correspond to the total number of cases due to involvement of multiple sites in the same case

Table-III
Distribution of respondents by tobacco consumption (n=100)

Tobacco use	No. of patient	Percent
Yes	99	99.0
No	1	1.0
Total	100	100.00
Male		
Use of only smokeless tobacco	17	37.78
Use of only smoking tobacco	5	11.11
Use of both smoking and smokeless tobacco	23	51.11
No Use of tobacco	0	0
Total	45	100.00
Female		
Use of only smokeless tobacco	54	98.18
Use of only smoking tobacco	0	0
Use of both smoking and smokeless tobacco	0	0
No Use of tobacco	1	1.82
Total	55	100.00

Table-IV*Distribution of the respondents according to habit of tobacco use by type (n=100)*

Habitual factor of tobacco use	No. of patient	Percent
Smokeless tobacco habit (Male)		
Chewing	40	88.9
No smokeless habit	5	11.1
Total	45	100.0
Smokeless tobacco habit (Female)		
Chewing	52	94.5
Both chewing & areca nut	1	1.8
Both chewing & gul	1	1.8
No smokeless habit	1	1.8
Total	55	100.0
Smoking tobacco habit (Male)		
Cigarette	23	51.1
Biri (Beedi)	5	11.1
No smoking habit	17	37.8
Total	45	100.0
Smoking tobacco habit (Female)		
No smoking habit	55	100.0
Total	55	100.0

Table-V*Distribution of the male respondents by duration and frequency of smokeless and smoking tobacco use (n=45)*

Tobacco use	Smokeless habit		Smoking habit			
	Chewing		Cigarette		Biri (Beedi)	
	N	%	N	%	N	%
Duration:						
< 5 years	5	12.5	4	17.4	-	-
5-10 years	6	15.0	3	13.0	1	20.0
10-15 years	8	20.0	4	17.4	3	60.0
15-20 years	11	27.5	6	26.1	-	-
> 20 years	10	25.0	6	26.1	1	20.0
Total	40	100.0	23	100.0	5	100.0
Frequency:						
< 5 sticks /day	2	5.0	5	21.7	-	-
5-10 sticks /day	12	30.0	4	17.4	3	60.0
10-15 sticks /day	25	62.5	12	52.2	2	40.0
> 15 sticks/day	1	2.5	2	8.6	-	-
Total	40	100.0	23	100.0	5	100.0

Table-VI*Distribution of the female respondents by duration and frequency of smokeless tobacco use (n=55)*

Tobacco use	Chewing		Areca nut		Gul	
	N	%	N	%	N	%
Duration:						
< 5 years	5	9.3	1	100.0	-	-
5-10 years	16	29.6	-	-	-	-
10-15 years	12	22.2	-	-	1	100.0
15-20 years	10	18.5	-	-	-	-
> 20 years	11	20.4	-	-	-	-
Total	54	100.0	1	100.0	1	100.0
Frequency:						
< 5 times/day	7	13.0	1	100.0	1	100.0
5-10 times/day	12	22.2	-	-	-	-
10-15 times/day	31	57.4	-	-	-	-
> 15 times/day	4	7.4	-	-	-	-
Total	54	100.0	1	100.0	1	100.0

Table-VII*Relationship of smokeless and smoking Tobacco habit with Oral Squamous Cell Carcinoma (OSCC)*

Tobacco habit	No. of respondent	%	χ^2 -value	df	p (at 5%)	Results
Use of smokeless tobacco (Male) :						
Chewing habit	40	88.9	0.445	2	0.801	Not significant at p <0.05
No habit	5	11.1				
Both smokeless & smoking tobacco (Male) :						
Both habit	23	51.1	0.570	4	0.966	Not significant at p <0.05
Single habit	22	48.9				
Use of smoking tobacco (Male) :						
Cigarette/Biri	28	62.2	1.077	4	0.898	Not significant at p <0.05
No habit	17	37.8				
Use of smokeless tobacco (Female) :						
Chewing habit	54	98.2	20.435	1	0.015	Significant at p <0.05
No habit	1	1.8				

Discussion:

A total of 100 purposively selected patients of oral cancer were included in the present study. Among them, highest (42%) were found in the 41 - 50 years age group¹⁰ in his study reported maximum (57.69%) occurrence of oral squamous cell carcinoma in the 41 - 50 years age group, which is consistent to the findings of the present study¹¹ in a prospective study reported maximum (27.78%) occurrence of oral cavity cancer in the age group of 41 - 50 in patients below 40 years and¹² reported maximum (38%) occurrence of oral squamous cell carcinoma in the age group of 41 - 50 years which correlates with the present study. In contrast to the present finding,¹³ reported highest (56%) occurrence in 51 - 60 years age group.

Forty five (45%) of the 100 cases were male and 55 (55%) were female in the present study with a male female ratio of 9 : 11¹⁰ in his study reported 38.46% occurrence in male and 61.54% occurrence in female which is in accordance with the findings of the present study.¹³ reported that 58.6% of oral cancer patients were male which do not corresponds with the findings of present study. In contrast to the present finding,¹³ reported more (68%) occurrences in male. A study in Iraq reported the predominance of male over female with a male female ratio of 2 : 1¹⁴ which do not correspond to the findings of the present study and this might be due to marked difference between study populations.

When compared the involvement of different sites in the current study, buccal mucosa was found to be the predominant site with 45.6% involvement, followed by buccal sulcus (16.5%), retromolar trigon (15.8%), alveolar mucosa and gingiva (10.1%) and tongue (4.4%). In agreement with the present findings¹⁰ reported buccal mucosa as the predominant (31.88%) site of involvement. A study by¹⁵ on 263 patients at Southern Taiwan found that the most common site of oral squamous cell carcinoma was the buccal mucosa (37.4%) which corresponds to the findings of the current study.¹⁶ reported that buccal mucosa is the commonest site in a study in Bangladesh and¹² reported the highest (34%) involvement of buccal mucosa in a study at Abbottabad of Pakistan which are in accordance with the findings of the present study.¹⁷ also found buccal mucosa to be the site at greater risk of malignancy in pan-tobacco chewers as compared to other intraoral sites which coincides with present findings.

Current study revealed that 99% patients had the history of tobacco consumption. Out of them, 5 (5%) patients were smokers, 71 (71%) patients consumed smokeless tobacco and 23 (23%) patients used both smoking and smokeless tobacco. Forty males and 54 females used smokeless tobacco which indicated that females were more addicted to smokeless tobacco than males.¹⁶ found that 32.3% of oral cancer patients were smokers, which agrees with the findings of the present study. At least 80% of oral cancer patients were smokers in the study conducted by²¹ which shows disparity with the current study and may be due to differences in habits of population of different geographic areas.

The present study found that 88.9% male consumed smokeless tobacco, 62.2% males were smokers, 51.1% males were both smoker and smokeless tobacco user. Fifty four (98.2%) out of 55 females were smokeless tobacco users. Among these 54 females, 52 had the habit of chewing tobacco only, 1 patient had the habit of chewing tobacco and areca nut, and 1 patient the habit of chewing tobacco and use of gul. Among 45 males, 11 (27.5%) chewing tobacco users and 06 (26.1%) smokers were consumer of tobacco for 15 to 20 years. Twenty five (62.5%) chewing tobacco user males consumed 10 to 15 times/day and 12 (52.2%) smoker males smoked 10 to 15 sticks daily. Out of 54 chewing tobacco user females, 16 (29.6%) patients were consumer for 05 to 10 years and 31 (57.4%) patients consumed 10 to 15 times daily.¹³ reported the history of betel nut chewing in 51.7% patients and the second most common habit of smoking was (37.9%).²⁰ found 59% smokers and 41% tobacco chewers in their study and the

most common form of smoking and chewing were found to be cigarette (69%) and zarda (94.4%) respectively.²² found 59% over all prevalence of tobacco consumption, and prevalence of bidi smoking, cigarette smoking and chewing betel quid with tobacco / zarda were 29.6%, 27.8% and 17.5% respectively²³ mentioned in their study that 33% patients were never smokers and 67% of patients had a history of smoking with an average of 49.4 pack/years. These findings do not correlate with current study.

The current study revealed that 99% patients had the history of tobacco consumption, 5% patients were smoker, 71% patients were smokeless tobacco user, and 23% patients were both smoker and smokeless tobacco user which strongly indicated that smokeless tobacco users were more affected by oral squamous cell carcinoma. There was statistically significant relation between the use of smokeless tobacco and the development of Oral Squamous Cell Carcinoma (OSCC). The study found that the use of smokeless tobacco by females is significant for the development of Oral Squamous Cell Carcinoma at 5% level of significance. But, the use of tobacco by males in any form (smokeless tobacco, smoking and, both smokeless and smoking tobacco) is not significant for the development of Oral Squamous Cell Carcinoma at 5% level of significance.¹⁹ Found 92 (77.3%) among 119 patients with oral cancer were tobacco consumer where 70 (76.1%) patients were tobacco chewers and 22 (23.9%) were smokers which correlates with the findings of present study.¹⁷ Found that paan-tobacco chewing to be the major risk factor for cancer of the buccal and labial mucosa which corresponds to the finding of current study.¹⁸ Found that majority (72.55%) patients were tobacco user among 51 patients of oral cancer which is in accordance with present finding. But, their study revealed more (59.52%) smokers than chewable tobacco user which does not correlate with the present findings and is probably due to attendance of more male patients during the study as smoking is mostly common in males than in females in Bangladesh.

Conclusion:

Tobacco is one of the most important public health issues in Bangladesh as it is an important current and future health risk which will cause stress on the health services. Although the health hazards of smoking are now generally accepted in most Western countries, the arguments are not still having much impact on poorer nations. This cross-sectional study found that 99% of the patients had history of tobacco consumption, both in the form of smoking and smokeless tobacco. Out of them, 62.2% males were smokers and 88.9% male and 98.2% female consumed

smokeless tobacco. The study found strong association between tobacco consumption and development of squamous cell carcinoma. The finding would certainly help clinicians to build up public health awareness for prevention of oral squamous cell carcinoma.

Recommendation:

The prevalence of tobacco related oral cancer in Dhaka Dental College and Hospital is quite high. It depends on frequency and distribution of tobacco consumption in various forms like smoking and smokeless tobacco. Hence the awareness among people is required to give up the habit of tobacco consumption. Further study with larger sample size and for a longer duration is hereby recommended for better analysis and result.

References:

- Bansal H., Sandhu V.S., Bhandari R., Sharma D., 2012 Apr-Jun. Evaluation of micronuclei in tobacco users: A study in Punjabi population. *Contem Clin Den*, 3 (2), 184-187.
- Pande P et al 2002. Prognostic factors in betel and tobacco related oral cancer. *Oral Oncol*, vol.38, pp.491-9.
- Chiba I, Muthumala M et al, 1998, Characteristics of mutations in the p⁵³ gene of oral squamous cell carcinomas associated with betel quid chewing in Sri Lanka. *Int, J cancer*, vol 77, no 6, pp839-842.
- Pisani et al. 1999. 'Estimates of the world wide mortality from 25 cancers in 1990' . *Int J Cancer*, vol 83, no. 1, pp. 18-29.
- Efroymson D, Ahmed S, 2003, Building momentum for tobacco control: the case of Bang Ladesh, In; de Beyer J, Brigdehn L W (eds) 2003, tobacco control policy. Strategies, success and setbacks, Wshington DC: World Bank and Research for the international Tobacco Control(RITC), pp13-37.
- Ahmed F., Islam K.M., 1990 Jun. Site Predilection of Oral Cancer and Its Correlation With Chewing and Smoking Habit - A Study of 103 Cases. *Bang Med Res Counc Bull*, 16 (1), 17-25.
- Rahman K, 2003, 'Regional summary for the South East Asia Region,' In safey O, Dolwick S, Guindon GE, (eds), The 12th World conference on tobacco or health. Tobacco control country profile (Monograph) 2nd ed. Atlanta: American Cancer Society, WHO, International Union against Cancer, pp. 38-40.
- Flora MS, Mascie-Taylor CGN, Rahman M, 2009, 'Gender and locality difference in tobacco prevalence among adult Bangladeshis', *Tob Control*, vol, 18, no. 6, pp. 445-450.
- Idris A M et al 1998. The Swedish sinus and Sudanese toombak: are they different? *Oral oncol*, vol.34, pp.558-66.
- Mamun S., 2012. The Role of Bone Scan in the Assessment of Mandibular Invasion by Oral Squamous Cell Carcinoma. Thesis, (Master of Surgery in Oral and Maxillofacial Surgery). University of Dhaka, Bangladesh.
- Talabansilade N.G., Ahmed K.M., Faraj F.H., 2010. Oral Cancer in Sulaimani : A Clinicopathological Study. *J Zankoy Sulaimani*, 13 (1) Part A, 1-8.
- Wahid A., Ahmad S., Sajjad M., 2005 Jan-Mar. Pattern of carcinoma of oral cavity reporting at dental department of Ayub Medical College. *J Ayub Med Coll Abbottabad*, 17 (1), 65-66
- Rab M.A., Ahmed M., Chowdhury G.M., Rahman T., Sadat S.M.A., Sarmin S., 2008 Jun. Oral squamous cell carcinoma with particular relation to aetiological factor : study of 75 cases. *Bang Arm For Med J*, 40 (1), 31-36.
- Al-Rawi N.H., Talabani N.G., 2008 Mar. Squamous cell carcinoma of the oral cavity : a case series analysis of clinical presentation and histological grading of 1,425 cases from Iraq. *Clin Oral Invest*, 12 (1), 15-18.
- Chen YK, Huang HC, Lin LM, Lin CC, 1999, Primary oral squamous cell carcinoma: An analysis of 703 cases in southern Taiwan., *Oral oncology*, vol.35, no.2, pp173-179.
- Sitan KN. Expression of P⁵³ Protein in oral squamous cell carcinoma. Thesis submitted to Dhaka University 2006.
- R. Sankaranarayanan, Stephen W. Duffy, G. Padmakumary, Nicholas E. Day, M Krishan Nair, 1990. Risk Factors for Cancer of the Buccal and Labial
- Urmi S.A., Zerim I., Farzan M.S.A., Kabir M.A., 2014 Jan. Tobacco Use Among Oral Cancer Patients in Two Selected Hospitals of Dhaka City - A Case Control Study. *Bang J of Den Res and Edu*, 04 (1), 4-7.
- Sawair F.A. Al-Mutwakel A, Al-Eryani K, Al-Surhy A, Maruyama S, Cheng J, Al-Sharabi A, Saku T, 2007 Jun. High relative frequency of oral squamous cell carcinoma in Yemen: qat and tobacco chewing as its aetiological background. *Int J Environ Health Res*. 17(3) 185-95.
- Ahmed S, Akter M, Mahzabeen R, Sayeed S, Momtaz H, Sayeed MA, 2008, Prevalence of Tobacco Consumption in a Rural Community of Bangladesh. *Ibrahim Med Col J*, 2 (2), 586.
- Bouquot J., Schoeder K., 1992. Oral Effects of Tobacco Abuse, *J of the Ame Den Ins for Cont Edu*, 43, 3-17.
- Khan MM Aklimunnessa K, Kabir MA, Kabir M, Mori M, 2006, Tobacco Consumption and Its Association with Illicit Drug Use among Men in Bangladesh, *Addiction*, vol. 101, no 8, pp.1178-1186.
- Schmidt BL, Dierks EJ, Home L, Potter B, 2004. Tobacco smoking history and presentation of oral squamous cell carcinoma, *J Oral Maxillofac Surg*. Vol.62(9), pp.1055-8.

Pattern and distribution of tumours and tumour-like lesions in the oro-facial region of children

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Abstract:

Introduction : Tumours and tumour-like lesions of children have bizarre pattern of distribution in oro-facial region. The proper treatment of this type of tumour has become a challenge for the maxillofacial surgeon due to diagnostic problem. This study was designed to determine the pattern, distribution, tissue origin and type of tumours and tumour-like lesions in the oro-facial region among the children, which would help for better diagnosis of this group of lesions and subsequent treatment. **Objective:** To determine the pattern and distribution of oro-facial tumours and tumour-like lesions in the children. **Materials and method:** This is a cross sectional descriptive study and was designed to determine the pattern and distribution of oro-facial tumours and tumour-like lesions of children. A total number of 71 cases of tumours and tumour-like lesions of age below 18 years were studied in the department of Oral and Maxillofacial Surgery in Dhaka Dental College and Hospital from January 2010 to June 2012. **Result:** Total number of patient was 71 in this study. Thirty two (45.1%) of these patients were less than 10 years old and the rest 39(54.9%) patients were older and residency distribution was 53(74.6%) in rural area and 18(25.4%) in urban area. Among the total patients 37(52.1%) were male and 34(47.9%) were female. In the total studied patient 67(94.4%) had benign and the rest 4(5.6%) had malignant types of lesion. In benign tumour, 30 were below 10 and 37 were older and there male female ratio is 1.1:1. In malignant tumour 2 were below 10 and 2 were older and there male female ratio is 1:1. Among the total benign tumours, 30 were odontogenic, and 37 were non-odontogenic. Most of the non-odontogenic tumours occurred in female patients and age was between 10 to 18 years. **Conclusion:** Orofacial tumours are not uncommon among the children and adolescents as observed. Study shows lower incidence of malignant tumours. In benign tumours higher incidence of non-odontogenic tumour was found in the age group 10–18 years and of female predominant. It indicates the probable relation of hormonal change of female sex child to adolescent.

Key Words: Pattern of tumour, Benign, Odontogenic, Non-odontogenic Children

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Introduction:

The oro-facial region including the jaw bones (maxilla, mandible) tongue, cheek, submandibular, sublingual, also parotid region and related tissues can be the site of multitude of neoplastic conditions. Oro-facial tumours have a predilection for the entire facial region: however, odontogenic tumours tend to affect the mandible

more than the maxilla, especially, in West African children¹. Tumour include congenital over growth, hamartomas and true neoplasms. These lesions involve both the oro-facial soft tissues and the jaws². Ameloblastoma derived from epithelial or mesenchymal elements or both those are part of tooth-forming apparatus. They are therefore, found almost exclusively in the mandible and maxilla but they can even be found in the gingival and buccal mucosa on some occasions³. In a study of benign tumour showed the prevalence of odontogenic tumours is 67% and among this ameloblastoma is the highest (80%)⁴. This study also shows that non-odontogenic tumour is 33% and among this fibrous lesion is the highest (50%). A study (One and half year) conducted in Dhaka Dental College showed 65 (1.69%) patients with tumours and tumour-like lesions out of 4159 attending in outpatient department of maxillofacial surgery⁵.

Ameloblastoma is the most common benign tumour (66.7%) and mandible is the more common site of occurrence for most odontogenic tumours with a ration of 2.3:1. Gender analysis showed a female predilection for

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most of the odontogenic tumours except ameloblastoma. Adenomatoid odontogenic tumour showed predilection for the maxillary anterior region⁶.

Most oral and maxillofacial tumours in children are benign or malignant tumours of soft tissue and bones⁷. Tumours affecting the lower face are common whilst those affecting the mid face are uncommon. Benign lesions found in the lower face are odontogenic or non-odontogenic tumours, predominantly ameloblastoma⁸.

Few data are available on the incidence of tumours and tumour-like lesions in children among various countries. It is very difficult to compare the results from the studies around the world had been highlighted earlier by some authors, owing to the absence of uniformity in the study criteria⁹. But oro-facial tumours are not uncommon among children and adolescents¹⁰.

So far it had been known that no study has been carried out in Bangladesh in relation to tumours and tumour-like lesions in children. This study was conducted to see the pattern, distribution and origin of tumours and tumour-like lesions in the oro-facial region among the children attending in Dhaka Dental College and Hospital.

The Research Question

What are the pattern and distribution of tumours and tumour-like lesions in the oro-facial region of children?

Review of Literature

In children and adolescents, neoplastic diseases are often benign and of mesenchymal origin¹¹. Tumour histology in this age group did not correspond to their clinical behavior¹². There are few reports of odontogenic tumours of children and adolescents in the literature^{2,13}. Review of the literature revealed that odontogenic tumours accounted for between 1.0 and 28.8% of oral lesions¹¹.

Ewing's sarcoma is a highly malignant tumour which develops from the medullary tissue of bone. It accounts for 4 to 5 percent of all primary bone tumours. Ewing's sarcoma is the second most common malignant bone tumour of childhood and adolescent, yet it is a rare tumour. Less than 3% of all Ewing's sarcoma originates in the maxillofacial region, usually involving the mandible, 90% occur in the first three decades of life and males are more often affected than females. Clinical symptoms such as swelling, pain and sensory disturbances are rather unspecific and sometimes be misleading¹⁴.

Ewing's family of tumours (EFTs) comprise highly malignant, nearly undifferentiated neoplasms including Ewing's sarcoma(ES), primitive neuroectodermal tumour

(PNET) and a spectrum of other unusual variants. For differential diagnosis sarcomas of bones and soft tissue as well as carcinomas of the salivary glands have to be taken in to an account. There are specific aspects related to certain developmental and biological characteristics that make a more conservative approach preferable in the management of childhood disease⁷.

Malignant odontogenic tumour represents 4.7 % of the entire odontogenic tumour. It is not surprising to find that most of the orofacial tumours seen in the young population are benign in nature. Benign non-odontogenic tumours and tumour-like lesions of oro-facial region among children are usually mesenchymal in origin. The most common lesions are giant cell lesions, fibromas and fibro-osseous lesions. The striking feature being inclusion of odontogenic keratocyst as benign tumour of odontogenic epithelium, termed as Keratocystic odontogenic tumour⁹.

Ameloblastoma is a fairly common tumour of Nigerian Africans accounting for 73% of odontogenic tumours and 24% of all tumours and tumour-like lesions of the oral and perioral structures¹⁵. Among the benign odontogenic tumour ameloblastoma is very common entity frequently seen in posterior mandible and in adult age groups. In an analysis of 706 odontogenic tumours found ameloblastoma to account for 11%¹⁶.

Central giant cell granulomas of the jaw occur predominantly in children and young adults with a predilection for females. They are most frequently located in the anterior part of the mandible. Central giant cell granulomas were formerly known as giant cell reparative granuloma first described in the jaw by jaffne in 1953. Central giant cell lesions of the jaws are uncommon. The clinical behavior ranges from a slow growing, asymptomatic radiolucent lesion, discovered on routine radiographs to an aggressive lesion presenting with pain, root resorption and a tendency to recur after curettage¹⁷.

Central giant cell granuloma (CGCG) is defined by the World Health Organization (WHO) as an intraosseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cell and occasionally trabeculae of woven bone. It is considered to be a benign intraosseous jaw lesion and more in primary tooth-bearing area of mandible and predominantly found in children and young adults¹⁸.

The group of cysts included tumour-like lesions are retention cysts of the small salivary glands like mucocele and retention cyst of small glands like ranula, Thyroglossal

duct cyst, Gastrogenic cyst, cystic hygroma, Dysontogenetic cysts of the tongue lined with respiratory epithelium¹⁹.

Congenital granular cell tumour is a specific lesion representing a hamartomatous proliferation of granular cells rather than a true neoplasm. It is present at birth as a mass arising from the anterior maxillary or mandibular gingiva. It is more common in females than in males (9:1) and more common in the maxillary gingiva than in the mandibular gingiva (3:1)²⁰.

Odontogenic tumours are a group of tumours in the orofacial complex arising from tooth forming tissues and is less in the children. Most are slow growing while a few are locally invasive and aggressive causing extensive local destruction. While majority of them are benign, a few are malignant and may metastasize outside the jaws. Among 546 cases mostly encountered odontogenic tumour was benign in nature with only 4.5% being of malignant variety. Ameloblastoma accounted for 69.2%, fibromyxoma 12.5%, adenomatoid odontogenic tumour (AOT) 4.6% and ameloblastic fibroma 3.1%. The malignant lesions encountered were intra-alveolar carcinoma 14 (2.6%), malignant ameloblastoma 6 (1.1%) ameloblastic fibrosarcoma 4 (0.7%) and ameloblastic odontosarcoma 1 (0.1%)⁸.

Ameloblastoma is the most common benign tumour (66.7%) followed by odontome (20%), adenomatoid odontogenic tumour (10%) and mandible is the more common site of occurrence for most odontogenic tumours with a mandible maxilla ratio of 2.3:1. Gender analysis showed a female predilection for most of the tumours except ameloblastoma⁶.

The incidence of odontogenic tumours in children is believed to differ according to country; this information is helpful to clinicians and oral pathologists. Although there have been some clinicopathological reports on odontogenic tumours, according to the World Health Organization (WHO), statistical data are available only in certain countries incidence of odontogenic tumour more in males²¹.

Odontogenic tumours are relatively rare in the child age group; however certain lesions such as adenomatoid odontogenic tumour and ameloblastic fibroma occurs predominantly in children and therefore remain an important diagnostic consideration^{22,6}.

Vascular lesions are among the most common congenital and neonatal abnormalities. Hemangiomas are benign

vascular anomalies which may occur in various areas throughout the body with 50% being located in the head and neck. Capillary hemangiomas are the most common with an incidence of 1-1.5% in infants. Hemangiomas usually appear a few weeks after birth and grow more rapidly than does the infant. The proliferative phase is followed by a spontaneous, slow involution. By the age of five years usually 50% of the lesions have involuted. This increases to nearly 70% by the age of 7 years and about 90% by the age of 9 years²³.

An Aneurysmal bone cyst (ABC) is an expansible, often multilocular, osteolytic lesion, with blood-filled spaces separated by fibrous septa containing giant cells and reactive bone and most of the patients are between 10-20 years of age. Its occurrence in the maxillofacial region is uncommon, with fewer than 100 reported cases in the Jaw and 9 originating in the condyle²⁴.

Aneurysmal bone cyst is not true tumour but tumour-like lesion. These are benign and may cause pathological fractures. It grows outwards and is located subperiosteally. These are benign tumour-like conditions and may cause pathological fractures²⁵.

The behavior of lesions depends on whether they are benign or malignant. The classification of oral tumours assists the dentist or oral surgeon in making a decision regarding the nature of the management of tumours since they are generally named after their cells of origin and Oral and maxillofacial tumours are common in children².

The Rationale

The existing data on tumours and tumour-like lesions in the oro-facial region of children shows difference in prevalence and distribution. So that proper diagnosis in proper time of this type of tumour is a debatable issue. In Bangladesh no study was performed previously to determine the pattern, distribution and tissue origin of tumours and tumour-like lesions in the oro-facial region of children. The optimum treatment of this type of tumour has become a challenge for the maxillofacial surgeon. This study was designed to determine the pattern, distribution, tissue origin and type of tumours and tumour-like lesions in the oro-facial region among the children, which would help for better understanding of this group of lesions and subsequent treatment.

Objectives

General Objective

To determine the pattern and distribution of oro-facial tumours and tumour-like lesions in the children.

Specific Objectives:

1. To find out the age and sex distribution of these tissue tumours
2. To find out the anatomical location of these tumours
3. To detect the histopathological type of these tumours
4. To determine the tissue origin of these tumours

Materials and Methods:

This cross sectional descriptive study of tumours and tumours like lesion in orofacial region of children was carried out in the department of Oral and Maxillofacial Surgery, Dhaka Dental College and Hospital. According to inclusion and exclusion criteria a total number of 71 patients of age below 18 years were studied from January 2010 to June 2012, who underwent biopsy or fine needle aspiration cytology (FNAC) of vascular tumour for different oro-facial pathologies.

Recruitment procedure:

Study subject were recruited on the basis of inclusion and exclusion criteria and convenient sampling.

Inclusion criteria:

- o Children below 18 years of age irrespective of gender
- o Histopathologically diagnosed case of tumours and tumour-like lesions
- o Fine needle aspiration cytological diagnosed case of these tumours
- o Patients and parents who gave consent to be included in the study

Exclusion criteria:

- o Adult above 18 years of age
- o Incomplete clinical data
- o Reports with doubtful and controversial diagnosis
- o Patient with major salivary gland tumours
- o Patient who refuses to attend the research

Patient with major salivary gland tumour are excluded in this study due to unavailability, because these group of patients are treated both in the department of Otolaryngology and Oral and Maxillofacial Surgery. So reported cases in this study from the Oral and Maxillofacial Surgery Department alone would not reflect the actual picture of tumours originated from major salivary glands.

Diagnosis of those tumour and tumour-like lesion was done by history, clinical findings and histopathological or cytopathological examination. For the purpose of this study, the findings were divided in clinical and histopathological / cytopathological group. The clinical, histopathological or FNAC findings were analyzed and also on age, sex, site and were co-related.

Data analysis:

Data were analyzed by SPSS, version 12, with the help of resource personnel in the field of biostatistics. Comparison was done by chi-square test or Fisher exact test. Any p value >0.05 was considered statistically insignificant. Data were presented as frequency and percentage in tables and figures.

Operational Findings:**Children:-**

According to Bangladesh government constitution Ballayoo Bibaho Protirodh act 1929 children are in the age group below 18 years. According to UNICEF definition a child means every human being below the age of 18 years unless under the law applicable to the child²⁶. This study included patients whose age was below 18 years.

Tumour:-

Tumours mean all types of benign and malignant tumour.

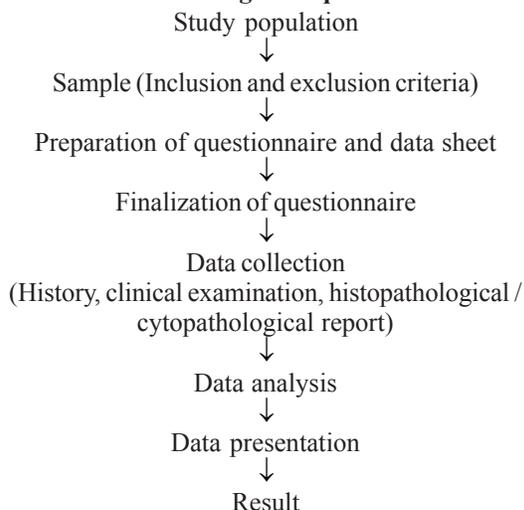
Tumour-like lesion:-

Tumour-like lesions included cyst of salivary gland origin: as for example, retention cysts of small salivary glands, Thyroglossal duct cyst, Cystic hygroma, Fibroepithelial polyp etc. Besides WHO histopathological tumour classification-2005 Odontogenic keratocyst included as a tumour-like lesion²⁷. Aneurysmal bone cyst and simple bone cyst are also included as tumour-like lesions.

Boundary of orofacial region:-

The orofacial region is made up of the entire maxilla and mandible supported by the covering soft tissue and encloses the tongue. The region is bounded superiorly by the nasal base and infra-orbital rim, posteriorly by the fronto-zygomatic suture, zygomatic arch, condyle head extra-orally and intra-orally up to oro-pharynx. The minor salivary glands of the lower lip, muscles and structures of the floor of the mouth are included in this region. Inferiorly, the mandible and hyoid bone forms a boundary. Posteriorly bounded by posterior border of ramus of mandible and anterior border of the sternocleidomastoid muscle.

Flow chart showing the sequence of chart:



Ethical clearance:

All patient having tumours and tumour-like lesions reported at Oral and Maxillofacial Surgery Department of DDCH from January 2010 to June 2012 were included in this study. The purpose of this study was to evaluate pattern and distribution of different type oro-facial tumours and tumour-like lesions. Since this is a cross sectional descriptive type of study, there was no physical risk of the patients through out the study period. All patients had a case number to maintain their confidentiality. No information was withheld from the patient. No experimental drug of placebo was used. All patients in this study were signed written informed consent form. Finally ethical committee of Dhaka Dental College had given the ethical clearance for this study.

Result:

During the period of one and half year, a total of 71 cases of tumours and tumour-like lesions were examined clinically, and followed by histopathological / FNAC examination done for various oro-facial lesions in patients aged 18 years or below. Thirty two (45.1%) of these patients were less than 10 years old and the rest 39(54.9%) patients were older and residency distribution was 53(74.6%) in rural area and 18(25.4%) in urban area (Table-1). Among the total patients 37(52.1%) were male and 34(47.9%) were female (Table-II).

Table-I
*Residence (n and %) by age**

Residence	Age		Total
	< 10 years N (%)	10 to 18 years N (%)	
Rural	24 (75.0)	29 (74.4)	53 (74.6)
Urban	8 (25.0)	10 (25.6)	18 (25.4)
Total	32	39	71

*No significant difference was observed (Chi square test; p value > 0.05)

Table-II
*Residence (n and %) by sex**

Residence	Sex of the child		Total
	Male N (%)	Female N (%)	
Rural	29 (78.4)	24 (70.6)	53 (74.6)
Urban	8 (21.6)	10 (29.4)	18 (25.4)
Total	37	34	71

*No significant difference was observed (Chi square test; p value > 0.05)

The residency distribution of the tumours and tumour-like lesions by age and sex of the patients are described in the following figures (Figure-1).

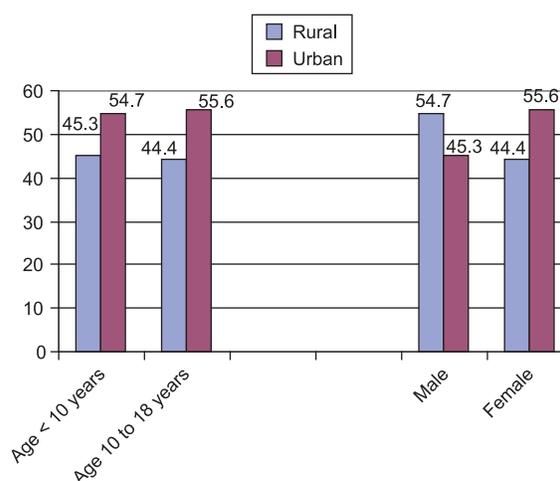


Fig.-1: Age (<10 years & 10-18 years) and sex distribution (%) of patient by residence. Patients age <10 years 45.3%(n=24) in rural, 54.7%(n=29) in urban area and age between 10 to 18 years 44.4%(n=8) in rural, 55.6%(n=10) urban area. Among male patients 54.7%(n=29) in rural area, 45.3%(n=24) in urban area and in female patients 44.4%(n=8) in rural, 55.6%(n=10) in urban area.

Among the patients studied 67 patients had benign and the rest 4 patients had malignant types of lesion. In benign tumour, 30 were below 10 and 37 were older and there male female ratio is 1.1:1. In malignant tumour 2 were below 10 and 2 were older and there male female ratio is 1:1. Described in the tables 3 and 4 among the 4 malignant tumours, two were Ewings sarcoma and one each was Granulocytic sarcoma and Burkitt's lymphoma.

Table-III

Type of tumours and tumour- like lesions by histopathological classification and age

Histopathology	Age group		Total
	<10 years N (%)	10 to 18 years N (%)	
Benign	30 (93.8)	37 (94.9)	67(94.4)
Malignant	2 (6.3)	2 (5.1)	4(5.6)
Total	32 (100)	39(100)	71

*No significant difference was observed (Chi square test; p value > 0.05)

Table-IV

Type of tumours and tumour- like lesions by histopathological classification and sex

Histopathology	Sex		Total
	Male N (%)	Female N (%)	
Benign	35 (94.6)	32 (94.1)	67(94.4)
Malignant	2 (5.4)	2 (5.9)	4(5.6)
Total	37(100)	34(100)	71

*No significant difference was observed (Chi square test; p value > 0.05)

The type of all benign tumours and tumour- like lesions and their distribution by age and sex are described in details in the following tables V and VI.

Table-V

Individual type of benign tumour by age

Type	Age group	
	< 10 years N (%)	10 to 18 years N (%)
Odontogenic Keratocyst	6 (20.0)	3 (8.1)
Ameloblastoma	1 (3.3)	8(21.6)
Ameloblastic Fibroma	4 (13.3)	1 (2.7)
Odontogenic Myxoma	2 (6.7)	1 (2.7)
Odontogenic Fibroma	2 (6.7)	2 (5.4)
Ossifying Fibroma	1 (3.3)	2 (5.4)
Fibrous Dysplasia	2 (6.7)	3 (8.1)
Giant Cell Granuloma	1 (3.3)	4 (10.8)
Giant Cell Tumour	1 (3.3)	0 (0)
Anurysmal Bone Cyst	1 (3.3)	0 (0)
Neurofibroma	1 (3.3)	0 (0)
Fibroepithelial Polyp	2 (6.7)	1 (2.7)
Gingival Hyperplasia	1 (3.3)	0 (0)
Cystic Hygroma	1 (3.3)	0 (0)
Haemangioma	4 (13.3)	8 (21.6)
Lymphangioma	0 (0)	2 (5.4)
Schwanoma	0 (0)	1 (2.7)
Oncocytoma	0 (0)	1 (2.7)
Total	30 (100)	37 (100)

*No significant difference was observed (Chi square test; p value > 0.05)

Table-VI

Individual type of benign tumour by sex

Type	Sex	
	Male N (%)	Female N (%)
Odontogenic Keratocyst	3 (8.6)	6 (18.8)
Ameloblastoma	6 (17.1)	3 (9.4)
Ameloblastic Fibroma	4 (11.4)	1 (3.1)
Odontogenic Myxoma	3 (8.6)	0 (0)
Odontogenic Fibroma	3 (8.6)	1 (3.1)
Ossifying Fibroma	1 (2.9)	2 (6.3)
Fibrous Dysplasia	1 (2.9)	4 (12.5)
Giant Cell Granuloma	2 (5.7)	3 (9.4)
Giant Cell Tumour	1 (2.9)	0 (0)
Anurysmal Bone Cyst	0 (0)	1 (3.1)
Neurofibroma	1 (2.9)	0 (0)
Fibroepithelial Polyp	2(5.7)	1 (3.1)
Gingival Hyperplasia	0 (0)	1 (3.2)
Cystic Hygroma	0 (0)	1 (3.1)
Haemangioma	6 (17.1)	6 (18.8)
Lymphangioma	0	2 (6.3)
Schwanoma	1 (2.9)	0 (0)
Oncocytoma	1 (2.9)	0 (0)
Total	35 (100)	32 (100)

*No significant difference was observed (Chi square test; p value > 0.05)

Among these benign lesions the site distribution was 67.2% (n=45) in mandible, 9.0% (n=6) in maxilla, 2.9% (n=1) in both maxilla and mandible, 22.4% (n=15) in other sites in relation to maxilla and mandible (Figure-2).

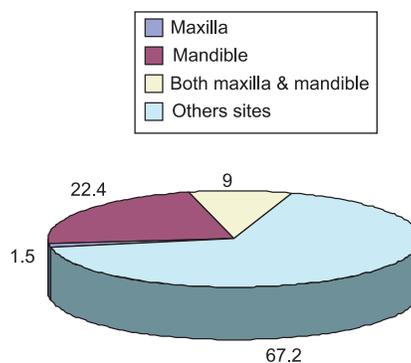


Fig.-2: Site distribution (%) of tumours and tumour- like lesions. In mandible 67.2% (n=45), in maxilla 9.0% (n=6), both maxilla and mandible 1.5% (n=1) and in other sites 22.4% (n=15).

Among the total benign lesions 30 were odontogenic, 37 patients were non-odontogenic (table VII). In the total odontogenic tumour patients 9 were Odontogenic keratocyst, 9 were Ameloblastoma, 5 were Ameloblastic fibroma, 3 were Odontogenic myxoma, and 4 were Odontogenic fibroma.

Among the total non-odontogenic tumour 3 were Ossifying fibroma, 5 were Fibrous dysplasia, 5 were Giant cell granuloma, 1 was Giant cell tumour, 1 was Anurysmal bone cyst, 1 was Neurofibroma, 3 was Fibroepithelial polyp, 1 was Gingival hyperplasia, 1 was Cystic hygroma, 12 were Haemangioma, 2 were Lymphangioma, 1 was Oncocytoma, and 1 was Schwanoma (table-VII).

Table-VII*Type of benign tumour by origin of dental tissue*

	Type of tumour	
	Odontogenic	Non-odontogenic
Odontogenic Keratocyst	9 (30.0)	0 (0)
Ameloblastoma	9 (30.0)	0 (0)
Ameloblastic Fibroma	5 (16.7)	0 (0)
Odontogenic Myxoma	3 (10.0)	0 (0)
Odontogenic Fibroma	4 (13.3)	0 (0)
Ossifying Fibroma	0 (0)	3 (8.1)
Fibrous Dysplasia	0 (0)	5 (13.5)
Giant Cell Granuloma	0 (0)	5 (13.5)
Giant Cell Tumour	0 (0)	1 (2.7)
Anurysmal Bone Cyst	0 (0)	1 (2.7)
Neurofibroma	0 (0)	1 (2.7)
Fibroepithelial Polyp	0 (0)	3 (8.1)
Gingival Hyperplasia	0 (0)	1 (2.7)
Cystic Hygroma	0 (0)	1 (2.7)
Haemangioma	0 (0)	12 (32.4)
Lymphangioma	0 (0)	2 (5.4)
Schwanoma	0 (0)	1 (2.7)
Oncocytoma	0 (0)	1 (2.7)
Total	30 (100)	37 (100)

Table VIII describe the site distribution of benign tumour and tumour-like lesions by age and sex. Of all odontogenic tumour 28 were in mandible and 2 were in maxilla.

Tumour involvement was observes as 30 in hard tissue, 14 in soft tissue, and 3 in both hard and soft tissue. Among the hard tissue involved tumour 5 were in the anterior region, 11 in the premolar region, 12 in the molar region, 2 in the palate, 4 in the angle of the mandible, 3 in angle and ramus of the mandible, 5 in the premolar and molar, 4 in the molar and palate, 5 in the premolar, molar and palate. Among the soft tissue involved tumour 5 were in the upper lip, 2 in the lower lip, 1 in the cheek, 5 in the tongue, 2 in the floor of the tongue, 1 in the gingiva.

Among the total benign lesions 44.8% (n=30) patients were odontogenic tumours (Table-VII). The most common odontogenic tumour were Odontogenic keratocyst 30.0% (n=9), and Ameloblastoma 30.0% (n=9), Ameloblastic fibroma 16.7% (n=5) and Odontogenic myxoma 10.0% (n=3). Among the patients with odontogenic tumours 15 were less than 10 years old and 15 were 10 to 18 years old (Table-IX). The sex distribution of odontogenic tumours were 19 in male and 11 in female. Male female ratio was 1.7:1 (Table-X)

There were 55.2% (n=37) patients non- odontogenic tumours (Table-VII) among the total benign tumours. The most common non-odontogenic tumours was haemangioma 32.4% (n=12) followed by fibrous dysplasia 13.5% (n=5) and giant cell granuloma 13.5% (n=5). Most of the non-odontogenic tumours 59.5% (n=22) occurred in patients in age between 10-18 years (Table-IX). In the sex distribution of non-odontogenic tumours male to female ratio is 1:1.3 (Table-10). Of all non-odontogenic tumours 17 in mandible, 5 in maxilla, 1 in both and 14 in others site (Table-VIII).

Table-VIII*Site distribution (n and %) of benign tumour by age, sex and type of tumour*

	Age		Sex of the child		Total
	< 10 years	10 to 18 years	Male	Female	
	N (%)	N (%)	N (%)	N (%)	
Maxilla	0 (0)	6 (16.2)	2 (5.7)	4 (12.5)	6 (9.0)
Mandible	24 (80.0)	21 (56.8)	28 (80.0)	17 (53.1)	45 (67.2)
Both maxilla & mandible	1 (3.3)	0 (0)	0 (0)	1 (3.1)	1 (1.5)
Others	5 (16.5)	10 (27.0)	5 (14.3)	10 (31.3)	15 (22.4)
Total	30	37	35	32	67



Ameloblastoma (Profile View)



Ameloblastic fibroma (Profile View)



Lymphangioma



Fibrous dysplasia



Burkkit's Lymphoma



Intra-oral view (Burkkit's Lymphoma)



Ewing's sarcoma



Intra-oral view Ewing's sarcoma

Table-IX
Type of tumour by age

Age	Type of tumour		Total
	Odontogenic N (%)	Non-odontogenic N (%)	
< 10 years	15 (50.0)	15 (40.5)	30 (44.8)
10-18 years	15 (50.0)	22 (59.5)	37 (55.2)
Total	30	37	67

Table-X
Type of tumour by sex

Sex	Type of tumour		Total
	Odontogenic N (%)	Non-odontogenic N (%)	
Male	19 (63.3)	16 (43.2)	35 (52.2)
Female	11 (36.7)	21 (56.8)	32 (47.8)
Total	30	37	67

In this study conclusive findings

Benign tumour	Malignant tumour
Benign tumours were more common in our population(99.4%)	Malignant tumour were less common in our population(5.6%)
Benign non-odontogenic tumour were more common than odontogenic	All malignant tumour were non-odontogenic type and 55% were Ewing's sarcoma
Non-odontogenic tumour were more common in the age group of 10-18 years (55.2%)	Equal percent of patient were in both <10 and 10-18 years age group
In benign non-odontogenic tumour male female ratio was 1:1.4	Male female ratio was 1:1

Discussion:

This study reports tumour and tumour-like lesions on a number of 71 children age below 18 years who were subjected to history taking, clinical examination and taking biopsy or FNAC over the period of one and half years.

As previous studies Ralf-Bodo et al have demonstrated, the vast majority of oral lesions in infants and children is of mesenchymal nature and was benign in character ranging from 84% to 99% of cases, malignant ranging from 1% to 16%⁷. However of all the cases of oro-facial tumours in this study only 5.6%(n=4) were malignant. This finding is not agreed with others as Bhaskar found 9%², Ulmanky et al. showed 9.5%, Arotiba 40.2%, and Ajinkya et al. 13.3%^{11,8,6}. Incidence of malignancy observed range of 1-16% reported by other European and North American studies, while the exceedingly high rate of 40% malignant tumours in Nigerian children is attributable to the high prevalence of Burkkit's lymphoma in that population. Ackerman et al. observed 4 to 5 percent of Ewing's sarcoma, in this study found 2.8%(n=2) cases of 71 patients. The low percentage of malignant tumours in this study could be due to the following reasons: inclusion of patients aged 18 years and below, inclusion of also tumour-like lesions in this study, and possibly, less sample size. It was found

that malignant tumours affects equally in male female (1:1). M. Elarbi reported that the male female ratio is 1.6:1. Most of the previous studies have found similar ratio, with a high male predominance⁹.

In this study total benign tumours were 94.4% (n=67) of jaw tumours and more in the mandible 67.2% (n=45) than in the maxilla 8.9% (n=6). Tumours were more in the mandible which is supported by Ezekiel et al and Ajinkya et al^{15,6}. In contrast S.B.Aregbesola et al shows benign jaw tumour was 49% (n=72) and slightly larger in the maxilla 56% (n=23) than in the mandible 44% (n=18)). This discrepancy is present may be due to Burkkit's lymphoma and other malignancy is less in Bangladeshi people, beside this study include both bi-maxillary and soft tissue involve tumours and also because of small sample size.

Odontogenic tumours were 44.8% (n=30) in this study among the all benign tumours. Bhaskar SN, Keszler et al. and Maatia JK describe that the rate of odontogenic tumours varies between 19% and 33.7%^{2,28,29}. Odontogenic tumours were found more often in male patients and ratio was 1.72:1, which is supported by Arotiba GT, in contrast female predominant was reported by Ralf-Bodo Trobs et al^{10,7}.

Various reports in the literature of Bhaskar, Ulmansky et al, Ezekiel et al confirm the rarity of odontogenic tumours in children and adolescents^{2,11,15}. These authors used various age categories for their subjects and considered odontogenic tumours within the spectrum of orofacial neoplasms. According to Ulmansky et al between 1.0 and 28.8% of pediatric oral lesions are odontogenic tumours¹¹. In this series of oral tumours and tumour-like lesions in children and adolescent > 18 years old, 44.8% (n=30) were odontogenic tumours. While this result was higher than the worldwide range given by Ulmansky et al¹¹. However Sharanjeet Gill et al observed that high prevalence of odontogenic tumour in young age while rare in children below 10 years of age. Odontogenic tumours were more often seen in the mandible 93.3% (n=28) while less in the maxilla and male female ratio were 1.7:1. In contrast G T Arotiba et al shows odontogenic tumours were located less amount in the mandible (68.8%),¹⁰ but the male female ratio was 1.6:1. which is supported by this study. Sharanjeet Gill et al describe as male :female ratio is 1.3:1.

Ameloblastoma occurred in 9 patients below 18 years old representing 30% of odontogenic tumours. Study shows that there were more in males (14.7%) than females (6.5%) and ratio was 5:2, while Ezekiel et al and Sadat et al demonstrate the ratio 2:1, which is very close to our study^{15,16}. Study about Ameloblastoma by Sadat SMA Shows that 33.4% patients are within the age range between 10-19 years and 95.83% present in the mandible. In this study among the total patients 1 patient were in the age group below 10 years of age and another 8 patients were in between 10 to 18 years of age and all 9 (100%) cases were in the mandible.

In this study Ameloblastic fibroma represents 16.7% (p=5) of total benign odontogenic tumour, all are below 10 year of age, male female ratio is 4:1. Among the tumour 4 in mandible and 1 in other side. In contrast Ezekiel Taiwo et al shows Ameloblastic fibroma is rare accounting for less than 7% of odontogenic tumour, male female ratio was 2:1 and occurred in younger age group¹⁵. Age group of ameloblastic fibroma in our study is 4 in age group below 10 and 1 is the age in between 10 to 18 years of old.

The most common non-odontogenic tumours were hemangioma 32.4%(n=12), then comes Giant cell granuloma 13.5%(n=5), fibrous dysplasia 13.5%(n=5), ossifying fibroma 8.1%(n=3). S.B.Adebesola et al. supported this data except hemangioma. R.Choung et al. reported that America and Canada show a higher incidence of giant cell and fibro-osseous lesions³⁰. Apart from these lesions, other benign non-odontogenic tumours and tumour-like

lesions showed varied clinical presentation and not seem to have any racial or geographical predilection.

Patient in the age between 10-18 years encountered for 59.5% (n=22) of the total patients of benign non-odontogenic tumours. Whereas M.Elarbi et al shows 43% of the total cases of benign non-odontogenic tumours and the age group was (10-14 years)⁹. Benign non-odontogenic tumours were found 1:1.4 (n=16, 21) between male and female patients, M. Elarbi et al shows male to female ratio being 1:1.7 and also comments that a high involvement of the female sex and more patients in age group of 10 to 14 years could possibly re-emphasize the role of hormones responsible for these kinds of lesions. Our study also co-relates these comments. The benign non-odontogenic tumours and tumour-like lesions seen in this study presented in maxilla 13.5%, in mandible 45.9%, in both maxilla and mandible 2.7% and in others 37.8%. There is not total but maximum supported by the study of M.Elarbi et al⁹.

The pathogenesis of vascular anomalies is controversial. While some author consider them to be developmental malformations, however some other regards them as hamartomas of blood vessels. They reported that more cases of haemangiomas in Northern Jordanian adolescents in age 12 to 18 years of age but found a preponderance of lymphomas in children younger than 6 years of age. In this series, 66.7% (n=8) vascular tumours were in children between the 10 to 18 years age.

In conclusion, orofacial tumours are not uncommon among the children and adolescents as observed. In this study lower incidence of malignant tumours, because Burkitt's lymphoma and other malignancy are less common in our population than that of African or other countries. The relatively higher incidence of non odontogenic tumour was found in the age group 10-18 years and of female predominant. It indicates the probable relation of hormonal change of female sex child to adolescent. But no available data was found regarding this.

Limitations of the Present Study

As the study was conducted in a particular tertiary hospital, so the findings can not reflect the general scenario of the country.

The relatively small sample size was another limitation in this study.

Conclusion:

Oro-facial tumours and tumours-like lesions have predilection for orofacial region of children and adolescents attending in the Dhaka Dental College and

Hospital. Most of the oral and maxillofacial tumours in children are present in the mandible, age group 10-18 years, female sex and benign non-odontogenic in nature. This result may enrich the knowledge of tumours and tumour-like lesions of childhood and subsequently would help to formulate protocol for disease pathology and their management.

Recommendations:

On the basis of the result of present study integrated with the understanding from the available literature it may be recommended that it will worthy to recommend further study, because the present study had very small sample size.

References:

- Grace EA Parkins, George Armah and Paick A. 2007 Tumour and tumours Like – Lesions of the lower face at Korle Bu Teaching, Hospital, Ghana-an 8 year Study. *World J. of Surg. Onco.* 5,48.
- Bhaskar SN 1963 Oral tumours of infancy and childhood, *J Paedtr* 63,195-210.
- Molla MR, Shaheed I, Shrestha P,1991 Ameloblastoma : A clinical study of 13 cases, *Bangladesh Med Res Counc Bulletin*.
- Ahmed MU 2008 Title: Management of benign lesions of Maxillofacial region, 4thNational conference and scientific seminar on Oral and Maxillofacial Surgery, Dhaka. (Abstract)
- BK Das 2008 Title: One and half year audit in outdoor OT of Dhaka Dental College. 4thNational conference and scientific seminar on Oral and Maxillofacial Surgery, Dhaka. (Abstract)
- Ajinkya, Rupkari JV, Mandle MS, Manisha S 2010 Odontogenic tumours : a review of 60 cases. *J Cli Exp Dent.* 2(4),183-186.
- Ralf-Bodo Trobs.Elinor Mader. Thomas Friedrich.Joachim Bennek 2003 Oral tumour and tumour-like lesions in infants and children. *Pediatr. Surg. Int.* 19,639-645
- Arotiba J.T, Ajike S.O. Akadiri O A, Fasola A.O, Akinmoladun.VI, Adebayo ET, Okoje VN, Kolude B, Obiechina AE. 2007 Odontogenic tumours: Analysis of 546 cases from Nigeria. *J. of Maxillofac and Oral Surg* 6, 44-50.
- M. Elarbi, R.El-Gehanim, K.Subhashraj, M.Orafi 2009 Orofacial tumours in Libyan children and adolescents. A descriptive study of 213 cases, *Int. J. of Ped. Otorhinol.* 73, 237-247
- Arotiba GT 1996 A study of orofacial tumours in Nigerian children. *Gac Med Mex,* 134,337-342
- Ulmansky M, Lustmann J, Balkin N 1999 Tumours and tumour-like lesions of the oral cavity and related structures in Israeli children. *Int. J. of Oral Maxillofac. Surg.* 28:291-294
- Chong ER,Kaban LB 1985 Diagnosis and treatment of jaw tumours in children. *J. Oral Maxillofac Surg* 43,322-332.
- Lucas RB 1984 Pathology of Tumours of the Oral Tissues, Vol. 31, 4th edition. *Edinburgh, Scotland. Churchill Livingstone,* 31:66.
- Molla MR, Haider MN, Rashid MH, Sikder MA, 2007 Ewing's sarcoma of mandible of a 5 years old boy: a Case report, *Bangladesh Dent. J.* 23, 33-35.
- Ezekiel Taiwo Adebayo,Sunday Olusegun Ajike,Emmanuel Oladekeye 2005 A review of 318 odontogenic tumours in Kaduna. *J. Oral Maxillofac Surg* 63, 811-819.
- Sadat SMA, Ahmed MU, Bhuiyan RA 2005 Ameloblastoma of Jaw: Aclinicopathologic study of 24 cases *J. of Bangladesh Orth. Society* 20,29-30.
- Ahmed MU, Hasan MN, Haider IA, 2004 Central giant cell granuloma of maxilla, Aggressive type: A case report of 14 years old boy. *Bangladesh Dent.J,* 20,48-50.
- Molla MR, Nessa J, Hakim S,Hossain S, Asadullah M 2005 Intralesional corticosteroid injection for central giant-cell granuloma: a case report. *Bangladesh Dent. J.* 21,33-36.
- UNICEF 31 July 2000 definition of the child. Book for the convention on the right of the child, *page 1.http://wed.nic.in/crcpdf/CRC-2-PDF.*
- Robert E. Marx. Diane Stern State 2007 Oral and Maxillofacil Pathology,A rational for diagnosis and treatment. Chicago, *Quintessence Publishing Co.p-427.*
- Hiroyuki Okada, Hirotsugu Yamamoto, EM Tilakaratne 2007 Odontogenic tumours in Sri Lanka: Analysis of 226 cases. *J Oral Maxillofac Surg* 65,875-882
- A.V.Jones, C.D.Franklin 2006 An analysis of oral and maxillofacial pathology found in children over a 30 – year period. *Int. J. of Ped. Dentistry,*16,19-30.
- KH Tarafder, BH Siddique,N Akter, M Alam, SS Kamal, M Alauddin 2003 Haemangioma in head-neck region- 5 years experience in BSM Medical University. *Bangladesh J. of Otorhinol.* 9,15-18.
- T.Ettl, K.Stander, S.Schwarz,T.E.Reichert, O. Driemel 2009 Recurrent aneurismal bone cyst of the mandibular condyle with soft tissue extension, *Int. J. of Oral and Maxillofac. Surg.* 38,699-703.
- Ebnezer John 2005 General Orthopedics, *Third edition. New Delhi: Jaypee Brothers.* P-580.
- UNICEF 31 July 2000 definition of the child. Book for the convention on the right of the child, *page 1.http://wed.nic.in/crcpdf/CRC-2-PDF.*
- WHO “Blue book” Barnes IARC Press in Lyon.2005 on the pathology and Genetics of the head neck tumour.
- Keszler A, Guglielmotti MB, Dominguez FV 1990 Oral pathology in children. Frequency, distribution and clinical significance. *Acta Odontologica Latinoamericana* 5:39-48
- Maaaita JK 2000 Oral tumours in children: a review, *J. Clin. Pediatr. Dent.* 24: 134-137
- R.Chong,LB.Kaban 1985 Diagnosis and treatment of jaw tumours in children, *J. Oral Maxillofac. Surg.* 43,323-332.

Oral health status among the under five children attending at OPD of Dhaka Dental College Hospital

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Abstract:

A descriptive type of cross sectional study was conducted at Dhaka Dental College Hospital at children OPD with a view to assess the oral health status among the under five children. Study revealed to find out selected dental conditions like dental caries, gingival and periodontal conditions and DMFT score and socio-demographic background. A total 120 under five children's parents were interviewed through a structured questionnaire followed by oral examination through a checklist. Among 120 children, 44.17% were male and 55.83% were female. Most of the children (94.17%) were found to clean teeth regularly by themselves. 70.83% children clean their teeth themselves with brush and paste once daily spending 1-3 minutes. Maximum children (73.33%) clean their teeth before breakfast. Fluoridated toothpaste was being used by most of the children (85.84%). Only 4.17% child change their toothbrush every month and 55.83% every two months and 40% after 3-6 months. Regarding feeding history, it was found that 58.33% children were given exclusive breast feeding. Most of the children (63.33%) take soft drinks. It was found from the study that 87.50% children had pink color oral mucosa and their gingival condition had normal. Though prevalence of dental caries was 96.67% but overall oral hygiene status was good (86.67%). Significant statistical association was found between frequencies of cleaning teeth but no statistical association was found between mothers' education and overall oral health status. The study revealed that, dental caries among the under five children was a major health concern creating awareness among the people about their own and their children's oral health through appropriate plan can reduce the dental diseases. Moreover mass media and general education of the people create vital role in this regards.

Key words: Oral health, dental caries, DMFT score.

(Bangladesh Dental Journal 2014; 30: 41-47)

Introduction:

Oral health and overall health and wellbeing are inextricably connected. The lips, tongue, gum (gingiva), oral mucosa and salivary glands are responsible to maintain the oral health. Oral diseases affect the most basic human needs: the ability to eat and drink, swallow proper nutrition. Many systemic conditions such as AIDS, diabetes, and osteoporosis have important oral symptoms, manifestations or complications. It is considered to be

localized infections only, periodontal or gum diseases are now being investigated as potential risk factors for the development of systemic disease. For instance, accumulating evidence now points to a possible link between periodontal diseases and the incidence of premature, low-birth weight babies, cardiovascular disease and pulmonary disease. Oral disease affects not only the health of the oral cavity and associated craniofacial structures, but can be detrimental to the overall health and well-being of individuals.¹

Oral health means much more than healthy teeth. It means being free of chronic oro-facial pain, oral soft tissue lesions, oral and pharyngeal cancers, birth defects such as cleft lip and palate, and sources of other diseases and disorders that affect the oral, dental and craniofacial tissues, collectively known as craniofacial complex.² Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum disease. The purpose of oral hygiene is to prevent the buildup of plaque, the sticky film of bacteria and food that forms on the teeth. Plaque adheres to the crevices and fissures of the teeth and generates acids that, when not removed on a regular basis, slowly eat away, or decay, the

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protective enamel surface of the teeth, causing holes (cavities) to form. Plaque also irritates gums and can lead to gum disease (periodontal disease) and tooth loss. Fluoride in toothpaste, drinking water or dental treatments also helps to protect teeth by binding with enamel to make it stronger. In addition daily oral care, regular visits to the dentist promote oral health. Preventative services include fluoride treatments, sealant application and scaling (scraping off the hardened plaque, called tartar) that are helpful to maintain the oral health.³

When infants are born, almost all of their primary teeth already have formed. These teeth are still hidden in the gums. They usually begin to erupt or cut through the gums at about 6 months of age. Some babies get teeth earlier, and some get later. Early childhood caries is a serious form of cavities. It can quickly destroy child's teeth. Children typically start to lose their baby (primary) teeth and replace them with adult teeth when they are 6 or 7 years old. Some children start losing teeth earlier, others start later. Most often, the first permanent teeth to come in are the lower front four teeth. However, some children get their first permanent molars (sometimes called 6 years molars) first. The 6 years molars come in behind the primary teeth. They do not replace primary teeth. Around age 11 or 12, the second permanent molars (also called 12 years molars) come in behind the 6 year molars. By the time of the child is 13 years old, most of his permanent teeth will be in place. Wisdom teeth, or third molars, come in between ages 17 and 21. However, some people don't get any wisdom teeth, or don't get all four. More often, wisdom teeth develop, but there may not be room in the mouth for them. We should continue to help the children brush their teeth twice a day until they are 8 years old or can show that they can do a good job on their own. Brushes after breakfast and before bed, keep the children's teeth free of food particles, especially the molars. Molars have lots of little grooves and crevices. Food particles can hide there and act as food for bacteria.⁴

A high-meat low carbohydrate diet often causes constipation followed by bouts of diarrhea. This results in a sluggish colon, with the excess protein accelerating water loss, and eventually a diminished supply of beneficial intestinal bacteria. The accelerated water loss, if not replenished, will cause more plaque buildup in the oral cavity as well. Children and young adolescents are the group that requires oral health care. Several studies were conducted in Bangladesh to have an idea of prevalence of dental caries and periodontal diseases.

Methods and materials:

This was a cross sectional type of descriptive study conducted among the under five children attending at OPD of Dhaka dental college hospital from January to June, 2011. Sample size was 120 taken by the technique of non probability purposive sampling technique. After explaining the purpose of the study data were collected through face to face interview of the guardians using a structured questionnaire and checklist for clinical examination of the children to find out the DMFT score. After completion of data collection, data were checked, verified entered into the computer and edited for consistency to reduce error. Data were analyzed by using Statistical Package for Social Science (SPSS) version 17 software. The important variables were considered and analyzed to fulfill the objectives of the study. The results were fashioned in tabular form and explained according to the findings.

Results:

Among the total 120 respondents, majority 69.17% (n=83) were in the age group of 4-5 years, female were 55.83% (n=67). Almost 99.17% (n=119) were Muslim. Out of the total respondents 41.67% (n=50) had graduate and above level of education and businessman were 54.17% (n=65), in case of mother's occupation housewife were 66.67% (n=80), monthly family income of 56.76% (n=68) was Tk. 10001-20000 and 19.17% (n=23) was Tk. 20001-30000.

Table-I
Socio-economic characteristics of the respondents: [n =120]

Socio-economic characteristics	Frequency	Percentage	
Age	Up to 3 years	15	12.50
	3-4 years	22	18.33
	4-5 years	83	69.17
Sex	Male	53	44.17
	Female	67	55.83
Religion	Islam(Muslim)	119	99.17
	Hindu	01	00.83
Father's education	Graduate or above	50	41.67
	Primary	28	23.33
Mother's education	Primary	39	32.50
	S.S.C	38	31.67
Father's occupation	Service holder	36	30.00
	Business	65	54.17
Mother's occupation	Housewife	80	66.67
	Service	30	25.00
Monthly family income	10001-20000Tk	68	56.76
	20001-30000Tk	23	19.17

Table-II (a) shows the distribution of the child's cleaning teeth. 113(94.17%) respondents said that their child cleaned teeth regularly and 07(05.83%) didn't. Out of 120,

51(42.50%) patients cleaned teeth by himself, 31(25.83%) under parents supervision and 38(31.67%) by himself and their parents. 103(85.84%) respondents said, the child use fluoridated toothpaste and 13(10.83%) use non-fluoridated toothpaste and 04(3.33%) use both fluoridated & non-fluoridated toothpaste.

Table: II (b) shows the distribution of the child’s cleaning teeth. 85(70.83%) respondents said that their child clean teeth once daily, 33(27.50%) twice daily and 2(01.67%) cleaned more than twice daily. Out of 120, 88(73.33%) respondents said that their child clean teeth before breakfast 07(5.83%) after breakfast, 08(6.67%) before breakfast & before going to bed and 17(14.17%) after breakfast & before going to bed.

Table: III show the distribution of the child’s method of cleaning teeth. 10(8.33%) children brushed teeth from above downwards, 39(32.50%) from side to side and 71(59.17%) both from above downwards & from side to side movement.

Majority 118(98.33%) children ate sweet/biscuit/chocolate and 02(01.67%) did not.

It also reported that 91(75.83%) children ate once daily & 29(24.17%) more than once daily. (Table IV)

Table V: shows the distribution of information on dental caries and DMFT score. Here majority 116(96.67%) of the children have dental caries and only 04 (03.33%) children have no dental caries. Upper jaw is affected in case of 29(24.17%) children, lower jaw is affected in case of 31(25.83%) children and both upper & lower jaw is affected in case of 44(36.67%) children. Missing teeth due to extraction absent in 117(97.50%) cases & present in 03(02.50%) cases. Number of filled teeth in 11(9.17%) cases & absent in 109(90.83%) cases.

Table VI: shows the distribution of variables on overall oral health status of the children. Overall oral health status is good in most cases that are 104(86.67%) and bad in 16(13.33%) cases.

Table-II (a)
Distribution of the respondents by their opinion regarding cleaning teeth

Serial	Variables		Frequency	Percentage
01	Does your child clean teeth regularly?	Yes	113	94.17
		No	07	05.83
		Total	120	100
02	How does your child clean teeth?	Cleans by himself	51	42.50
		Cleans by parents	31	25.83
		Cleans by himself & by their parents	38	31.67
03	What type of toothpaste is used for cleaning teeth?	Fluoridated	103	85.84
		Non-fluoridated	13	10.83
		Both Fluoridated & Non-fluoridated	04	03.33
Total			120	100

Table-II (b)
Distribution of the respondents by their opinion regarding cleaning teeth

Serial	Variables		Frequency	Percentage
01	How many times your child clean teeth daily?	Once	85	70.83
		Twice	33	27.50
		More than twice	02	01.67
		Total	120	100
02	When does your child clean teeth?	a)Before breakfast	88	73.33
		b)After breakfast	07	05.83
		c)Before breakfast and before going to bed	08	06.67
		d)After breakfast and before going to bed	17	14.17
Total			120	100

Table-III*Distribution of the respondents by their opinion regarding method of cleaning teeth*

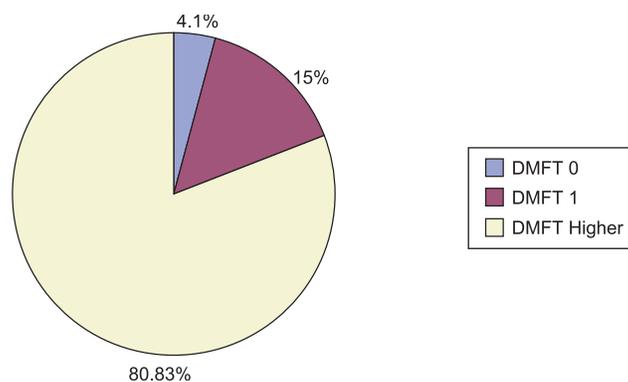
Serial	Variables		Frequency	Percentage
01	What type of method used for brushing teeth?	a)Brush teeth from above downward	10	08.33
		b)Brush teeth from side to side movement	39	32.50
		c) a+b	71	59.17
	Total		120	100

Table-IV*Distribution of the respondents by their opinion regarding consumption of sugary food*

Serial	Variables		Frequency	Percentage
01	Does your child eat sweet/ biscuit/chocolate?	Yes	118	98.33
		No	02	01.67
		Total	120	100
02	If yes, how many times?	Once	91	75.83
		More than Once	29	24.17
		Total	120	100

Table-V*Distribution of variables on dental caries and DMFT score*

Serial	Variables		Frequency	Percentage
01	Dental caries	Present	116	96.67
		Absent	04	03.33
02	Number of affected teeth	Present	116	96.67
		Absent	04	03.33
03	Type of affected set	a)Upper jaw	29	24.17
		b)Lower jaw	31	25.83
		c) a+b	44	36.67
		d) Nil	16	13.33
04	Missing teeth due to extraction	Present	03	02.5
		Absent	117	97.50
05	Filled teeth	Present	11	09.17
		Absent	109	90.83
06	Number of filled teeth	Present	11	09.17
		Absent	109	90.83

**Fig.-1:** shows the distribution of variables on DMFT score.

DMFT 0 in 05(04.17%) cases, DMFT 1 in 18(15%) cases and DMFT higher in 97(80.83%) cases.

Table-VI
Distribution of variables on overall oral health status of the children

Serial	Variables	Frequency	Percentage	
01	Overall oral hygiene status	Good	104	86.67
		Bad	16	13.33
	Total	120	100	

Discussion:

This cross sectional study on under five children was undertaken to assess their oral health status. Purposely chosen 120 respondents were participated having primary teeth in their mouth. Their parents accompanying the children, answered most of the questions of a structured questionnaire, after that their oral health status was evaluated through an examination checklist. Dhaka Dental College hospital was selected as the study place.

The present study revealed that, out of 120 patients 83(69.17%) were 4-5 years old and 22(18.33%) was 3-4 years old. Among them 53(44.17%) were male & 67(55.83%) were female. Out of 120, 119(99.17%) were Muslim and 01(0.83%) were Hindu. In case of respondents father's education majority 50(41.67%) were Graduate or above and in case of respondents mother's education 39(32.50%) were Primary level, 38(31.67%) were S.S.C level. Among 120, 36(30%) respondent's father were service holder and majority 65(54.17%) were business man. In case of patients mother's occupation majority were housewife 80(66.67%) and 30(25%) were service holder. (Table-I)

Maximum respondents 113(94.17%) said that the child clean teeth regularly and 07(5.83%) said that the child didn't clean teeth regularly (Table-IIa). Necmi N. Vehit HE et al.⁵ in their study had reported regular brushing habit in only 64% of Turkish pre-school children. So the current study compared to the Turkish children of the same age group. Out of 120, 51(42.50%) patients cleans teeth by himself, 31(25.83%) cleans teeth under parents supervision and 38(31.67%) cleans by himself and with the help of their parents. 103(85.84%) respondents said, their child use fluoridated toothpaste and 13(10.83%) use non-fluoridated toothpaste and 4(3.33%) use both fluoridated & non-fluoridated toothpaste. The use of fluoride toothpaste was higher than the report by Ullah MS, Aleksejunienene J et al.⁶

According to opinion regarding

cleaning teeth, 85(70.83%) child clean teeth once daily, 33(27.50%) teeth twice daily and 2(1.67%) more than twice daily (Table-IIb). Twice daily brushing was practiced among

only 26.7%. Petersen PE, Danilia I et al. had found in their study that 37% of the Romanian children brushed their teeth at least twice a day; 26% had their teeth cleaned by their mothers every day.⁷

More than seventy percent respondents said that their child clean teeth before breakfast, 7(5.83%) after breakfast, 8(6.67%) before breakfast & before going to bed and 17(14.17%) after breakfast & before going to bed. 100% respondents said that, their child use toothbrush and toothpaste for brushing teeth (Table-IIb). 10(8.33%) children brush teeth from above downwards, 39(32.50%) brush teeth from side to side movement and 71(59.17%) both from above downwards & from side to side movement (Table-III). Zhu and Peterson in their study had reported slightly higher level of correct tooth brushing practice among Chinese children and adolescents.⁸ Majority 118(98.33%) children who ate sweet/biscuit/chocolate had higher DMFT and the rest 2(0.67%) who did not eat sweet/biscuit/chocolate had lower DMFT (Table-IV).

A study was conducted by Rashid⁹ in the OPD of Rajshahi Medical College Hospital among 200 preschool children aged between 2-5 years. The children were examined of dental chair with mouth mirror and dental probe. The attendants of the children were asked questions regarding sugar consumption, frequency of breast-feeding and feeder use, consumption of lozenges, chewing gums, ice cream etc. the children were divide into high sugar consumption (N121) and low sugar consumption groups (N79) according to the amount and frequency of sugar intake. Children who consumed more sugar had a mean dm of 4.5 compared to mean DMFT of 1.5 among the low sugar consumption group.

Here majority 116(96.67%) of the children had dental caries. Upper jaw was affected in case of 29(24.17%) children, lower jaw was affected in case of 31(25.83%) children and both upper & lower jaw in case of 44(36.67%) children. Here female are more prevalent for dental caries. Only 53(44.17%) male children had caries and 67(55.83%) female children had caries. Caries was more prevalent in children whose

family had less awareness, economic conditions of the parents had replied that improper cleaning of teeth, sweetened food more taken could be the cause of dental caries. (Table-V) A similar study on mother's perception about the causes of dental caries among children was done by Awal¹⁰. In his study he found male children were higher prevalence (38.2%) of dental caries than female children (37.6%) of the same age group. Caries was more prevalent in children whose family had higher education. 60.1% of the mothers had replied that improper cleaning of teeth could be the causes of dental caries. Missing teeth due to extraction absent in 117(97.50%) cases & present in 03(02.50%) cases. Number of filled teeth in 11(9.17%) cases & absent in 109(90.83%) cases. Henkuzena I, Care R et al.¹¹ had reported 31% of Latvian children having filled teeth and 9.5% of them having missing teeth. A prospective cohort study conducted by R S Levine, Dr. OBE et al¹² to describe the incidence of dental caries, in the primary molar teeth of children aged approximately 3-6 years attending general dental practices in the North West of England. The study population consisted of 739 children aged between 2.8 and 6.2 years; 620 children (84%) were caries free at recruitment. The incidence of developing a first carious (into dentine) lesion in caries free children increased with age at four, the incidence of the first carious lesion was 95 per 100 person years and at age seven it was 196 per 100 person years. The tooth specific incidence of caries was found to be approximately 5-6 times greater in children with caries at recruitment than in caries free children.

The DMFT status is the summation of decayed, missing, and filled teeth in the primary dentition. The DMFT status 0 was assessed as healthy primary dentition and DMFT 1 or higher was assessed as presence of decayed, missing and filled teeth. In this study, regarding DMFT score and overall oral hygiene status of the children, DMFT 0 in 5 (4.17%) cases, DMFT 1 in 18(15.00%) cases and DMFT higher in 97(80.83%) cases. In present study, DMFT 1 & higher score in 115(95.83%) cases. (figure- 01). Necmi N. Vehit HE et al.⁵ in their study had found dmft score of 0 was recorded in 28% of the children, while 77(72%) children demonstrate dmft score of 1 or higher. A similar study was done by Sayegh A, Dini EL et al¹³ revealed that 67% in Amman 4 to 5 years old children had some caries experience and 33% had DMFT greater than 4. The present study revealed that overall oral health status was good in most cases that were 104(86.67%) and bad in 16(13.33%) cases.

Conclusion:

This cross sectional study among the under 5 children attending at OPD of Dhaka Dental College Hospital was

under taken to assess their oral health status. Purposively selected 120 under five children's parents were interviewed through a structured questionnaire followed by oral examination through a check list. The children were from middle and well to do families of Dhaka and seemed to practicing oral hygiene well in terms of tooth cleaning. Most of them used to clean their teeth themselves with brush and paste, once daily spending 1-3 minutes. They were habituated with fast foods and snacks, sugar added milk etc. Their parents seemed to be aware of the importance of dental health and participated with eagerness. They further ask few questions on dental health even. The prevalence of Dental Caries among the children was 96.67%. The study revealed positive relation with monthly family income, mother's educational status with over all oral health status. More income and better parent education yielded better oral hygiene status. Also positive association was noted between frequency and time taken for brushing with over all oral health status. More frequent brushing spending more time in it tend to yield better oral hygiene status the study suggests. So this study simply state that parents education, awareness, income and children's oral hygiene practice had profound effects on over all oral health status of the under five children.

References:

1. Anonymous; The burden of oral diseases; National Institute for Dental and Craniofacial Research, USA; Strategic plan; December, 2008; www.nidcr.nih.gov
2. Anonymous; National Institute for Dental and Craniofacial Research, USA
3. Wikipedia (internet dictionary); Definition of Oral Hygiene; <http://medical.dictionnaire.free.dictionnaire.com/Oral+Hygiene>
4. Sayegh A, Dini E, Holt R et al; Oral health, socio demographic factors, dietary and oral hygiene practices in Jordanian children; Journal of Dentistry, Volume 33, Issue 5, Pages 379-388; <http://flinkin.ghub.elsevier.com/retrieve/pii/S0300571204001770>
5. Necmi N. Vehit HE, Can G. Risk factors for dental caries in Turkish preschool children. Journal of Indian Society of Pedodontics and Preventive Dentistry. 2005; 23(3): 115-118.
6. Ullah MS, Aleksejunienene J, Eriksen HM, Hussain MA, Chowdhury NA, Hossain MM Oral health of 12-year-old Bangladeshi Children. Bangladesh Dental Journal, 2002; 18:11-16.
7. Petersen PE, Danilia I, Samoila A, Oral health behaviour, knowledge, and attitudes of children, mothers, and schoolteachers in Romania in 1993. Acta Odontol Scand, 1995; 53 (6):363-368

8. Zhu L, Peterson PE. Oral health knowledge, attitudes and behavior of children and adolescents in China International Dental Journal, 2003; 53: 289-298
9. Rashid MA. Caries prevalence of preschool going children of high and low sugar H consumption groups. Bangladesh Dental Journal. 1993-94; 10 (1):38-40
10. Awal MA. A study on the mother's perception about the causes of dental caries among children in a selected urban area of Bangladesh Dissertation of NIPSOM, DPH Course 1993-94
11. Henkuzena I, Care R, Regovska I, Dental status among 2-6 year old children in Riga city, Latvia. Baltic Journal of Maxillofacial surgery. 2004;6: 28-30.
12. R S Levine, Dr. OBE, Summary of: The incidence of dental caries in the primary molar teeth of young children receiving National Health Service funded dental care in practices in the North West of England British Dental Journal 2008. 205: 384 - 385 (2008)
13. Sayegh A, Dini EL, Holt RD, Bedi R. Food and drink consumption, sociodemographic factors and - dental caries in 4-5-year-old children in Amman, Jordan. British Dental Journal 2002; 193 (1): 37-42.

Oral hygiene practice among the school children in selected schools at Dhaka city

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Abstract:

A cross-sectional study was carried out among 600 students of class IV-VIII (aged 10-14 years) in selected schools of Dhaka city to observe their oral hygiene practice through a pre-tested semi-structured questionnaire. Results showed that 92.5% respondents understood the importance of taking care of their oral cavity. The 76.7% respondents agreed that regular brushing would prevent tooth decay. Out of all, 69.2% respondents brushed their teeth regularly where, 69.2% brushed once daily, 27.5% brushed twice and only 3.3% brushed more than twice a day. Among all, 92.5% respondents used toothbrush and 83.3% used tooth paste for brushing teeth. Significant association ($p < 0.05$) was observed between mothers occupation and knowledge of regular brushing prevents tooth decay. In conclusion, students would be the appropriate target group to receive the organized intervention towards improving the oral health status and thus reducing the prevalence of oral diseases. School based Dental Health Education Program may be one of the most important applicable ways to enhance the success of better oral health for our children.

Key words: Oral hygiene, parents' occupation, prevention, self-care practices.

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Introduction:

Oral health has been defined as “the standard of health of the oral and related tissues which enables an individual to eat, speak and socialize without active disease, discomfort and embarrassment and which contributes to general well-being”. Oral health has strong biological, psychological and social projections, because it affects our aesthetics and communication, and the quality of life is affiliated with oral health status¹. Most oral diseases, like most chronic pathologies in general, are directly related to lifestyle. Oral disease can be considered a public health problem due to its high prevalence and significant social impact. Chronic oral disease typically leads to tooth loss, and in some cases has physical, emotional and economic impacts. These impacts lead in turn to reduced welfare and quality of life. To minimize these negative impacts of chronic oral disease, there is a clear need to reduce harmful

oral health habits. Such a reduction can be achieved through appropriate health education programs².

In modern dentistry, “prevention” receives special attention and precedes treatment. Through simple prevention techniques such as hygiene training, fluoride therapy, tooth brushing and supplementary instruments, caries prevalence and periodontal diseases have been reduced significantly. As a result, the needs of treatments, that are mostly expensive and time consuming, have been decreased³. The change from an unhealthy attitude to a healthy attitude will occur given adequate information, adequate motivation and adequate practice of the measures to be adopted by the subject. The educational program targeted at the individual, aiming to change an unhealthy conduct, will be a complete failure if they do not consider the different aspects of the subject's life, both socioeconomic and environmental, that influences their behavior and are responsible for diverse health problems⁴. Oral health is linked to happiness and good general health and there is evidence that aesthetically acceptable and functionally adequate dentitions affect self-esteem, confidence and socialization⁵.

Materials and Methods:

This cross sectional study was carried out among 600 school children in selected schools of Dhaka city from January 2015 to April 2015 to observe their oral hygiene practice through a pre-tested semi-structured questionnaire. Students of class IV-VIII (aged 10-14 years)

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from different schools of Dhaka city on the basis of selecting criteria were included in the study. Data was checked and edited after collection. Statistical analyses of the results obtained by Statistical Packages for Social Sciences (SPSS-21) software (SPSS Inc, Chicago, IL, USA). Results were presented in tables and figures. Statistical terms included in the study were mean, standard deviation, frequency and percentage. The relationships between different variables were analyzed using the Pearson’s Chi-square test. Statistical significance was set at $p < 0.05$ and confidence interval at 95% level.

Results:

Table-1 showed that mean age of the respondents was 12.0 ± 2.5 years. Seventy five percent (75%) respondents were males and the rest (25%) were females. Out of all, 85% were muslim and the rest (15%) were hindu. Among the fathers of the respondents, 61.7% were service holder, 35.8% business and 2.5% engaged in other jobs. Among

the mothers of the respondents, 34.2% were service holder, 3.3% business and 62.5% engaged in household activities.

Table-II summarized the oral hygiene related variables of the respondents. Out of all, 69.2% respondents brushed their teeth regularly and 30.8% did not. Among them, 69.2% brushed teeth once, 27.5% brushed twice and 3.3% brushed their teeth more than two times in a day. The 92.5% respondents used toothbrush, 5.8% finger and 1.7% used other device for tooth brushing. Off all, 83.3% used tooth paste, 15.8%, tooth powder and 0.8% used other materials for brushed their tooth. About the knowledge on oral hygiene care, 76.7% thought yes, 20.0% thought no and 3.3% had not any idea about regular brushing prevent tooth decay. Again, 92.5% respondents thought yes, 6.7% thought no and 0.8% had not any idea about the importance of taking care of oral cavity.

Figure-1 showed that among all respondents, 70.0% had received and 30.0% did not receive information from media

Table-I
Socio-demographic distribution of the respondents (n=600)

Age (years)	Mean±SD		
	12.0±2.5		
Gender	Male (%)	Female (%)	
	450 (75.0)	150 (25.0)	
Religion	Muslim (%)	Hindu (%)	
	510 (85.0)	90 (15.0)	
Parents' Occupation	Service (%)	Business (%)	Other (%)
Father	370 (61.7)	215 (35.8)	15 (2.5)
Mother	205 (34.2)	20 (3.3)	375 (62.5)

Table-II
Oral hygiene related variables of the respondents (n=600)

Regular Tooth Brushing	Yes (%)	No (%)	
	415 (69.2)	185 (30.8)	
Frequency of Tooth brushing	Once (%)	Twice (%)	More (%)
	415 (69.2)	165 (27.5)	20 (3.3)
Device used for Tooth brushing	Tooth brush (%)	Finger (%)	Others (%)
	555 (92.5)	35 (5.8)	10 (1.7)
Adjuvant used for Tooth brushing	Tooth paste (%)	Tooth powder (%)	Others (%)
	500 (83.3)	95 (15.8)	5 (0.8)
Knowledge on Regular Tooth brushing	Yes (%)	No (%)	Don't know (%)
	460 (76.7)	120 (20.0)	20 (3.3)
Knowledge on Importance of taking Oral care	Yes (%)	No (%)	Don't know (%)
	555 (92.5)	40 (6.7)	5 (0.8)

about oral care. Nearly thirty seven percent (36.7%) received and 63.3% did not receive information from dentist about oral care; and 59.2% received and 40.8% did not receive information from teacher about oral care. Of all, 65.0% received and 35.0% did not receive information from parents about oral care.

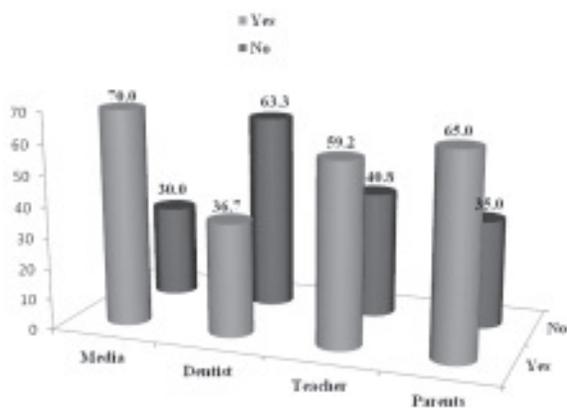


Fig.-1: Information related oral care of the respondents (n=600)

Table-III presented the association between mother’s occupation and knowledge (regular brushing prevent tooth decay) of the respondents. Out of 205 mother who did service, 120 respondents thought regular brushing prevent tooth decay; out of 20 mothers who did business, 10 respondents thought the same and out of 375 mothers who engaged in household activities, 330 respondents had the same view. Significant association was observed between mother’s occupation and respondents thought about regular brushing prevent tooth decay (p< 0.05).

Table-III

Association between mother’s occupation and knowledge (regular brushing prevent tooth decay) of the respondents (n=600)

Mothers’ Occupation	Regular Brushing Prevent Tooth Decay			Total	p Value
	Yes	No	Don’t know		
Service	120	70	15	205	0.04
Business	10	10	0	20	
Other	330	40	5	375	
Total	460	120	20	600	

Discussion:

The present study showed that 69.2% respondents regularly brushed their teeth while 30.8% were irregular in brushing. Again 69.2% respondents brushed their teeth

at least once in a day, 27.5% brushed twice daily while 3.3% brushed more than twice in a day. 92.5% respondents used toothbrush and 83.3% used tooth paste as tooth cleaning adjuvant. In a study it was observed that approximately 69% subjects brushed their teeth at least twice daily, while 17% reported irregular tooth brushing. Approximately 83% subjects reported using toothbrush and toothpaste to clean their teeth⁶. In another study it was also observed that more than two third (67.9%) of the respondents using tooth brush as tooth cleaning device. Finger was used as tooth cleaning device by 17.8% respondents. Tooth cleaning adjuvants were tooth paste (42.8%) and tooth powder (35.7%). Only 3.6% respondents were found using no adjuvant for their tooth cleaning. Majority of the respondents (67.9%) brushing their teeth only one time and 28.5% respondents brushed twice daily⁷.

The present study showed that majority (92.5%) of respondents thought it was important to take care of oral cavity. Rest 6.7% thought that it was not important, while 0.8% did not know about it. However 76.7% respondents thought regular brushing prevents tooth decay while 20% did not think. Significant association was observed between mother’s occupation and thinking of respondents that regular brushing prevents tooth decay (p<0.05). In a study 83% subjects reported that it was very important to them to look after their teeth and only 1.3% reported that looking after their teeth was unimportant⁸. In another study majority (81%) of the subjects showed awareness of the importance of tooth brushing for caries prevention. Parents’ role in daily oral care was reported to be mainly related to giving advice on the importance of brushing (59%)⁶.

The present study showed that 65% respondents got information for oral care from parents while 35% did not. The 59.2% respondents said they had advice from teacher and 36.7% respondents from dentist for oral care. Interestingly, 70.0% respondents declared that they got information about oral care from media about taking care of tooth from viewing television. In a study among 12 year-old Chinese, 41.7% of respondents were informed about oral health care, 47.2% declared that they never received any oral health instruction while 11.3% were not aware of it⁹.

Conclusion:

The present study revealed that knowledge of risk factors for oral disease is important in oral health campaigns that aim to promote healthy habits. Family is the first school and mother is the first tutor for children. The study suggests that student would be the appropriate target

group to receive the organized intervention leading towards improving the oral health status and reducing prevalence of oral diseases. School based Dental Health Education Program may be one of the most important applicable ways to enhance the success of better oral health for our children.

References:

1. Gabre P, Martinssorr T, Gahnberg L. Incidence and reasons for tooth mortality among mentally retarded adults during a 10 years period. *Acta Odontol Scand* 1999; 57: 55-61.
2. La evidencia de la eficacia de la promoción de la salud. In "La evidencia de la eficacia de la promoción de la salud" edited and translated by the Spanish Ministerio de Sanidad y Consumo. *RCOE* 2002; 7: 537-45.
3. Denielsen B, Manj F. Transition dynamics in experimental gingivitis in human. *J Periodontol* 1984; 24: 258-60.
4. Redmond CA, Blinkhorn FA, Kay EJ et al. A cluster randomized controlled trial testing the effectiveness of a school-based dental health education program for adolescents. *J Public Health Dent* 1999; 59(1): 12-17.
5. Fiske J, Davis DM, Frances C, Gelbier S. The emotional effects of tooth loss in edentulous people. *Br Dent J* 1998; 184: 90-93.
6. Al-Omiri K, Al-Wahadni AM. Oral Health attitudes, knowledge and behavior among school children in North Jordan. *J Dent Edu* 2006: 179.
7. Ahmed S, Lima FR. Tooth Brushing Practices and Oral Hygiene Status of the Children of a Selected Village in Bangladesh. *City Dent Coll J* 2015; 12(1): 13-16.
8. Smyth E, Caamaño F, Fernández-Riveiro P. Oral health knowledge, attitude and practice in 12-year-old school children. *Med Oral Pathol Oral Cir Bucal* 2007; 12(8): E614-20.
9. Zhu L, Petersen PE, Wang HY, et al. Oral health knowledge, attitude and behavior of children and adolescents in China. *Int Dent J* 2003; 53: 289-98.

Endodontic treatment of teeth associated with large periapical lesion

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Abstract:

Most periapical diseases are induced as a result of direct or indirect involvement of oral bacteria. The etiologic factors are oral contaminants through the root canal or degenerating pulpal tissues. Therefore, mere surgical removal of the periapical lesions without proper root canal disinfection and obturation will not result in the healing of periapical tissues. This case report describes the non-surgical management of a large periapical lesion. In this case a 27-year-old female patient presented into private practice having discolored mandibular right central and lateral incisor with periapical lesion of endodontic origin. Conservative root canal treatment was carried out for the involved tooth. The clinical and radiographic examination after 12 months revealed complete healing. The appropriate diagnosis of periradicular lesion and the treatment of the infected root canal system allowed complete healing of these large lesions without endodontic surgery. Emphasis is laid on thorough debridement and three dimensional obturation of root canal system by a simple lateral condensation technique.

Key words: *Periapical lesion, Calcium hydroxide, Root canal treatment.*

(Bangladesh Dental Journal 2014; 30: 52-55)

Introduction:

Pulpal tissue can be infected through various ways such as caries or trauma, making the pulpal tissue necrotic. The microbial aggregation or its by-products can infiltrate into periradicular tissues and stimulate the host defense system, resulting in periapical/periradicular tissue destruction. Although this defensive lesion may be helpful to prevent further progress of the microbial infection, it is not self-healing and results in various types of lesions¹

In most cases of large periapical lesions of pulpal origin, we often encounter a dilemmatic situation, such as whether to either treat these cases endodontically or surgically. However, tendency of the clinician towards non-surgical approach is increasing day by day due to advancements of scientific knowledge, development of techniques,

instruments and root canal medicaments. The general consensus is that bacterial reduction or elimination from the root canal system by effective biomechanical preparation will lead to more successful outcomes². In a series of studies showed that pulpo-periapical lesions have the potential for healing without surgical intervention³. Some clinician demonstrated successful clinical management of large periradicular lesion by the use of calcium hydroxide used as an interim dressing⁴.

Investigation have shown that large periradicular lesion may respond positively to nonsurgical endodontic treatment⁵⁻⁷ in cases where response to conservative treatment is not successful other treatment modalities like periradicular surgery or even extraction may be necessary to allow the lesion to heal⁶. The following case report describes a conventional endodontic treatment of mandibular right central and lateral incisor associated with a large periradicular lesion.

Case Report:

A 27-year-old female patient attended a private dental clinic with a chief complaint of discolored mandibular anterior teeth having sinus tract at right mandibular central and lateral incisor buccally. Patient gave a history of trauma 11 years back. The patient had no significant medical history. Extraorally, there was no evidence of swelling and intraorally, a sinus tract was present buccally. The tooth was non responsive to palpation, percussion as well as vitality test. The periodontal probing revealed a normal intact gingiva. Radiographic examination showed an evidence of large radiolucency with discontinuity of periodontal ligament and lamina dura (Figure 1). A non-surgical endodontic therapy of the mandibular right central and lateral incisor was planned.

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After access cavity preparation, the working length was determined on the basis of radiographs. A K file (0.8) was used to identify the canal. Individual canal instrumentation was performed sequentially by K file (Densply, Mailliefer, Switzerland) #15-35, using step-back technique, accompanying with copious irrigation with 2.5% sodium hypochlorite between instruments and recapitulation was always done to verify the working-length during biomechanical preparation. Master cone was selected (ISO# 35). Calcium hydroxide was placed into the canal with lentulospiral filler as the intracanal medicament and the access cavity sealed with zinc oxide eugenol cement. Patient was recalled after three days to receive a fresh dressing of calcium hydroxide. This procedure was repeated again after a week. Clinical evaluation was performed after seven days. Tooth was asymptomatic and

the sinus was healed. Obturation was performed with gutta-percha and sealer (Dia-Proseal, Diadent Group, Korea) by lateral condensation technique (figure 3). After two weeks of treatment, teeth were permanently restored with composite (Densply, Mailliefer, Switzerland). The patient was recalled after one, six and twelve months. The sign and symptoms, including the sinus tract, had disappeared after one month of treatment. On 6 month and one year recalls, the patient had no sign and symptom; periapical radiographic evaluation demonstrated complete bony regression of the lesion (figure 4). Clinical exam revealed no sensitivity to percussion and palpation.



Fig.-1: *preoperative radiograph showing periapical lesion*

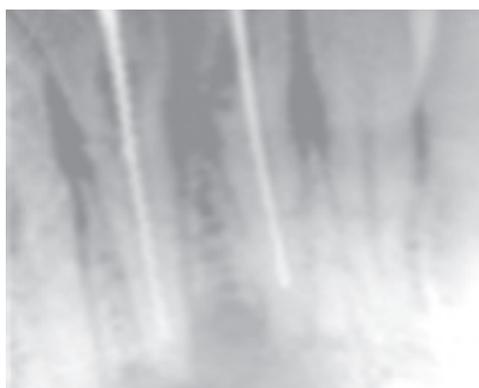


Fig.-2: *Working length determination*



Fig.-3: *Radiograph immediately after obturation*

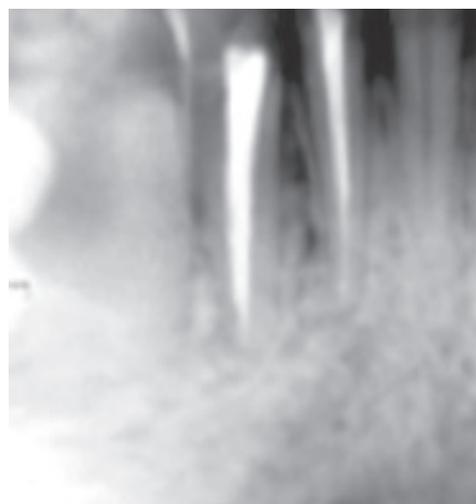


Fig.-4: *Radiograph after 12 months, revealing complete repair*

Discussion:

Radiographic evaluation is the most widely used method for detection of periapical lesions. Periapical lesions can be detected radiographically only when loss of alveolar bone is accompanied by cortical bone involvement during

the development of the periapical pathological process. For this reason periapical lesions in their earlier stages may not be visualized.⁵

As mentioned in previous studies, in the cases of periradicular lesions, sufficient biomechanical cleaning of the root canal system is the most critical factor for cleaning. It has been demonstrated that in these cases, non-surgical root canal therapy should be the first line of treatment² and approximately 74% of 42 endodontically treated teeth in one study showed bony healing within their large periradicular lesions⁷. While some studies have shown no difference between large and small lesions healing ability⁸. According to Caliskan the prognosis for large periradicular lesions is lower⁷. Caliskan stated that in approximately 70% of cases with periapical lesion, the healing was apparent within 2 years of treatment.⁹. However some authors reported that some cases with periapical lesions had completely disappeared from 1 to 12 month after treatment.⁶ In the present paper, we observed that periapical healings completed during the 12 months observation time.

When the root canal treatments are done according to accepted cleaning and shaping procedures, and are able to eliminate the entire microorganisms, necrotic tissues as well as the remnants of organic tissues from the infected root, the success rate is generally high¹. Accepted endodontic treatments may induce a favorable healing process. Recently, a study reported that programmed cell death has an important role in the entire healing process.¹⁰

Root canal treatment is based primarily on the removal of microbial infection from the complex root canal system. Irrigants and intracanal medicaments aid in reducing the microbial flora of infected root canals. In the present study, calcium hydroxide was used as the intracanal medicament. It has been shown that use of calcium hydroxide as a dressing for 1 week efficiently eliminates bacteria from the root canals.

Calcium hydroxide is an intracanal medicament that is commonly used because of its ability to predictably disinfect the RCS. The mechanisms of Ca(OH)₂ are not fully understood. Additionally its biological properties are achieved by the dissociation in Ca²⁺ and OH⁻ ions.¹¹ The antimicrobial effects of calcium hydroxide relate directly to its high pH 12.5, it has a destructive effect on cell membranes and protein structures.¹² Because it plays a major role as an inter appointments dressing in the

disinfection of the root canal system, a Ca(OH)₂ powder mixed with sterile saline water was used as an antibacterial dressing in this case.

The root canal system should be filled three dimensionally and the final hermetical coronal restorations are needed.¹

Permanent restoration within two weeks of RCT also contributed to periradicular healing, as several studies have shown that an adequate coronal restoration placed as soon as possible after RCT plays an important role in the outcome of endodontic therapy.¹³⁻¹⁵ This patient was a young healthy subject and these factors will contribute to successful healing. Previous studies have showed that the patients general health may have an influence on the healing process in periradicular lesions². Radiographic changes such as the increase in density of the lesion and trabecular regeneration, confirmed healing in addition to the absence of signs and symptoms. However it is difficult to be sure of complete healing with conventional radiographic techniques.

Conclusion:

In this case report showed excellent healing of large periapical lesion through conventional root canal treatment. Emphasis was laid on thorough debridement, disinfection, use of calcium hydroxide and three dimensional obturation of the root canal system. This report demonstrating that even large periapical lesion can respond favorable to non-surgical endodontic treatment. Non-surgical approach should be considered before attempting to surgery.

References:

1. Cohen S, Hargreaves KM, Pathways of the pulp. 9th edition. St. Louis: Mosby;2006.pp.541-2.
2. Broon NJ, Bortoluzzi EA, Bramante CM. Repair of large periapical radiolucent lesions of endodontic origin without surgical treatment. *Aust Endod J* 2007; 33:36-41.
3. Seltzer, Soltanoff, Bender. Epithelial proliferation of periapical lesions. *Oral Surg* 1969;27:111-5.
4. Cvek, Heithersay GS. Calcium hydroxide in treatment of pulpless teeth with associated pathology. *J Endod* 1975;8:76.
5. Ozan U, Er K. Endodontic treatment of a large cyst-like periradicular lesion using a combination of antibiotic drugs: a case report. *J Endod* 2005;31:898-900.
6. Oztan MD. Endodontic treatment of teeth associated with a large periapical lesion. *Int Endod J* 2002;35:73-8.
7. Caliskan MK. Prognosis of large cyst-like periapical lesions following nonsurgical root canal treatment: a clinical review. *Int Endod J* 2004;37:408-16.

8. Sjogren U, Hagglund B, Sundqvist G, Wing Ks. Factor affecting the long term results of endodontic treatment. *J Endod* 1990;16:498-504.
9. Caliskan MK, Turkun M. periapical repair and apical closure of a pulpless tooth using calcium hydroxide. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1997;84(6):683-7.
10. Kim S, Pecora G, Rubinstein RA. Color atlas of microsurgery in endodontics. Toronto: WB Saunders; 2001. p.13.
11. Fava LR, Saunders WP. Calcium hydroxide pastes: classification and clinical indications. *Int Endod J* 1999; 32(4):257-82.
12. Pacios MG, de la Casa ML, delos Angeles Bulacio M, Lopez ME. Calcium hydroxide's association with different vehicles: in vitro action on some dentinal components. . *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003;96(1):96-101.
13. Kayahan MB, Malkondu O, Canpolat C, Kaptan F, Bayirli G, Kazazoglu E. periapical health related to the type of coronal restorations and quality of root canal fillings in a Turkish subpopulation. *Oral Surg Oral Med Oral Radio Endod.* 2008;105:58-62.
14. Siqueira JF Jr, Rocas IN, Alves FR, Campos LC. Periradicular status related to the quality of coronal restorations and root canal fillings in a Brazilian population. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2005;100:369-74.
15. Heling I, Gorfil C, Slutzky H et al. Endodontic failure caused by inadequate restorative procedures: review and treatment recommendations. *Prosthet Dent* 2002;87:674-8.

Orthodontic management of a case of Class II Div 1 malocclusion (incisor based) with crowding in both anterior segment & multiple supernumerary teeth: A case report

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Abstract

We describe the treatment of an adolescent boy age 10 years, with Class II div-1 malocclusion with crowding due to multiple supernumerary teeth. Treatment consisted mainly of extraction of supernumerary teeth, leveling and alignment of malposed tooth with edgewise fixed appliances by multiloop technique. Due to patient good cooperation, treatment time reduced to 24 months. However the treatment resulted in Class I molar occlusion with proper alignment of upper & lower anterior segment, an ideal overjet, overbite and incisor angulations.

Key Words: Class II div-1 malocclusion, supernumerary teeth, malposition of tooth, edgewise orthodontic therapy.

(*Bangladesh Dental Journal 2014; 30: 56-60*)

Introduction:

According to incisor classification which was adopted by the British Standards' Institute in 1983 is considered simpler & more relevant than Angle's classification, the Class II malocclusion defined as the mandibular incisor edges lie posterior to the cingulum plateau of the maxillary central incisors. Class II malocclusion has two subdivisions : div-1 & div-2. It is called Class II div-1 when the maxillary central incisors are proclined or of average inclination & there is an increased overjet.

Class II is the most common & difficult to treat malocclusion as compared to other malocclusions, due to its wide ranging varieties & interplay of various types of etiological factors.

It is important for every orthodontist to have adequate knowledge & correct understanding of the various types of Class II malocclusions before instituting a treatment plan. There is no universal method of managing the condition. It is essential to have an adequate knowledge

of normal growth pattern & various cephalometric analysis for proper diagnosis & treatment planning.

Case Report:

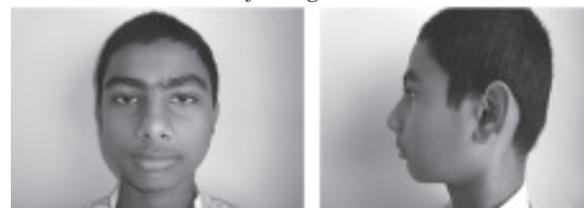
Case history:

Md. Nur Alom, age 10years, came to the Department of Orthodontics & Dentofacial Orthopedics at Dhaka Dental College & Hospital for treatment. He had Class II div-1 malocclusion with malposed teeth in upper anterior arch due to several supernumerary teeth. Patient's major reason for seeking treatment was to improve his dental esthetics and function. He complained of his ugly look during smile and difficulties to bite with his teeth.

Clinical examination



Profile-Right side



Facial photo-Frontal view

Profile-Left side

Fig.-1: Pre-treatment extra-oral facial photographs

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Shape of the head	: Mesocephalic
Profile Analysis	: Convex
Shape of the face	: Oval
Facial symmetry	: Symmetrical
Lips	: Potentially competent
Upper lip line	: Normal
Lower lip line	: Normal
Naso-labial angle	: Obtuse
Labio-mental depress	: Shallow
Temporo-Mandibular joint	: Normal path of closure
Breathing	: Nasal
Deglutition	: Normal.

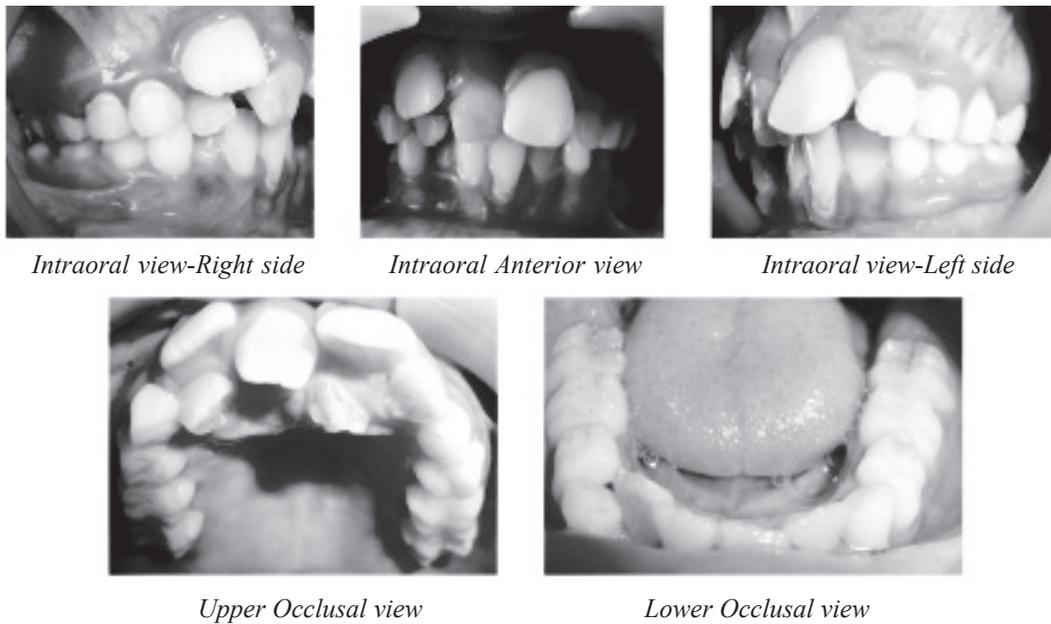


Fig.-2: Pre-treatment intra-oral photographs

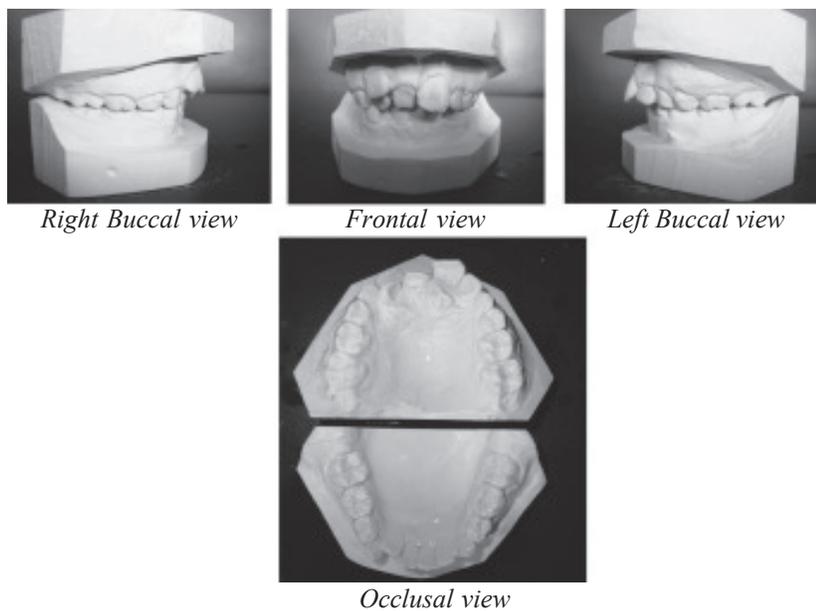


Fig.-3: Pre-treatment intra-oral photographs of models

The patient was in the mixed dentition. He presented with an overjet of 10 mm, and the overbite was 3mm. Molar relationships were Class II on both sides & Incisor relationship was Class-II div-1. His oral hygiene was poor.

Radiographic examination:



Fig.-4: pre-treatment OPG.

Permanent teeth are seen erupting. 3 supernumerary teeth present in upper jaw.

Lateral Cephalometric Radiograph:



Fig-5: Pre-treatment lateral cephalogram and tracing

Table-I

Pre-treatment lateral cephalometric tracing results

Parameter	Reference Measurement ⁵ ($\pm 2^\circ$)	Patient's Measurement
SNA (angle)	82°	88°
SNB (angle)	80°	77°
ANB (angle)	2°	11°
Inter incisal angle	131°	124°

The analysis of lateral cephalogram revealed that the patient had a Class II div-1 dental relation on Class II skeletal base relationship. The maxillary incisors were proclined but mandibular incisors were of average inclination.

Treatment Objectives:

- Establishment of normal overbite & overjet.
- Correction of crowding.
- Correction of inter incisal angle.
- Improvement of functional demand by correcting better occlusal interdigitation.

Treatment plan:

- Extraction of all 3 supernumerary teeth.
- Extraction of all deciduous canines and molars.
- Alignment and leveling of upper anterior teeth.
- Approximation of upper central incisors.
- Further reassessment of the case.
- Retention by Hawley retainer.

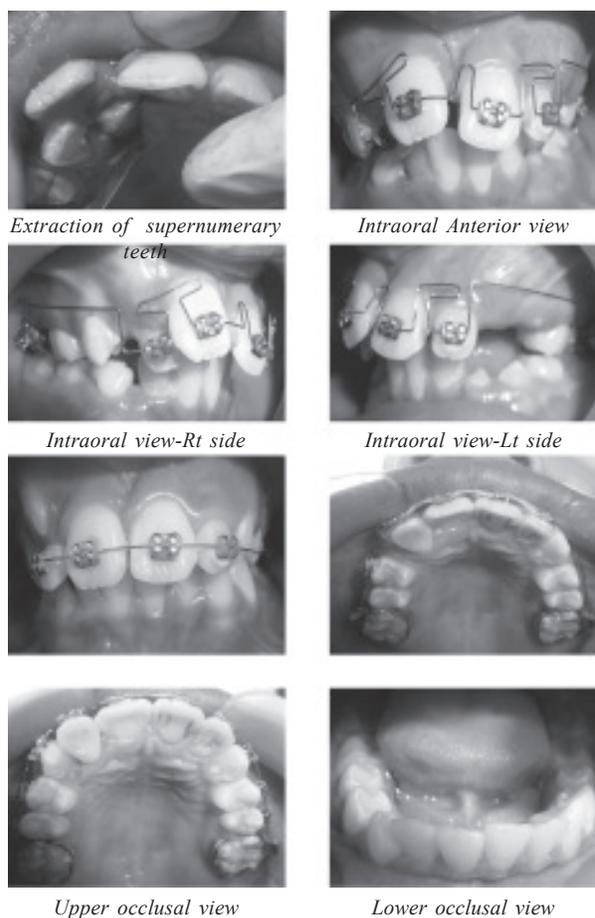


Fig-6: During treatment photographs

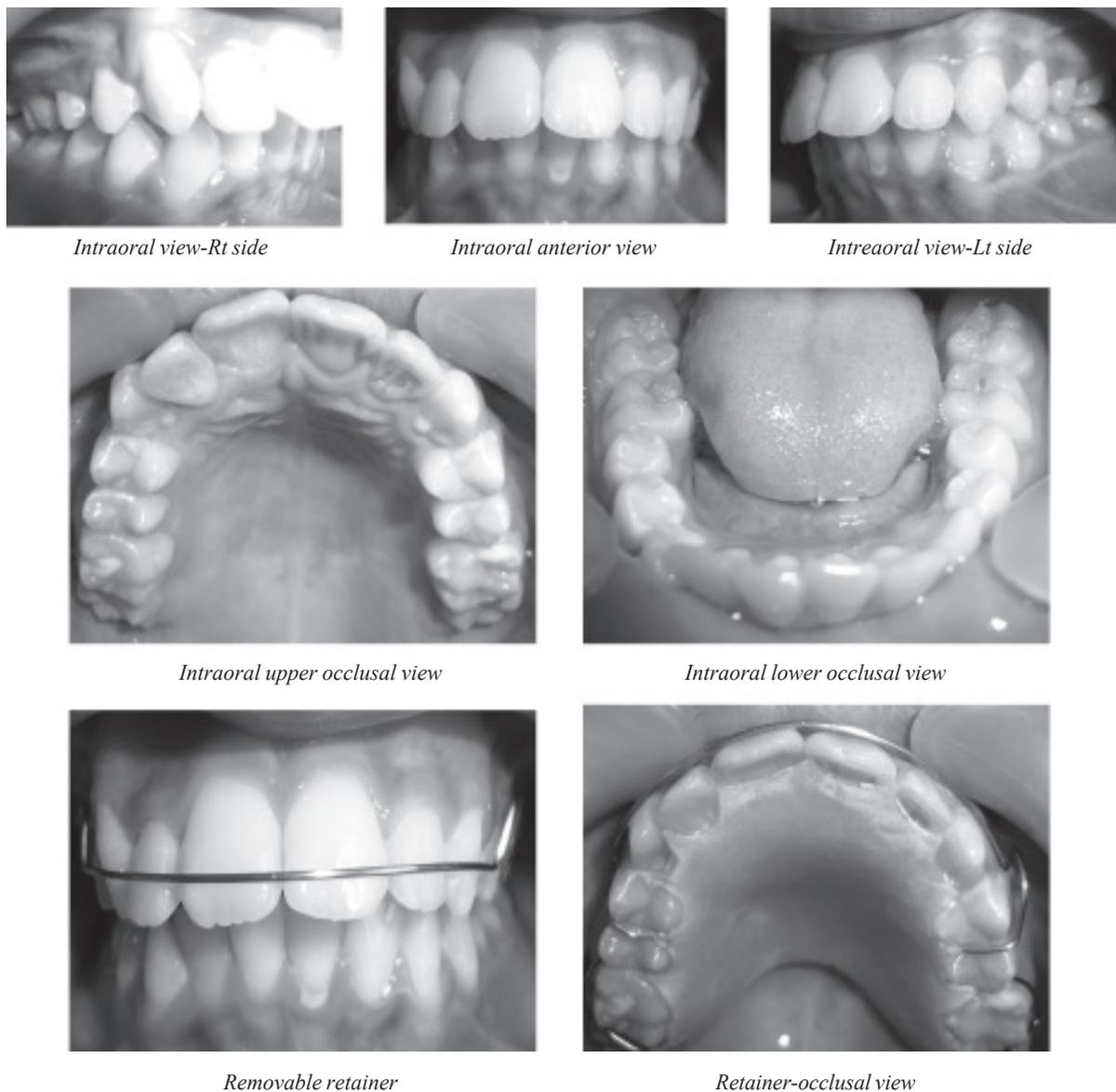


Fig.-7: Post-treatment intra-oral photographs

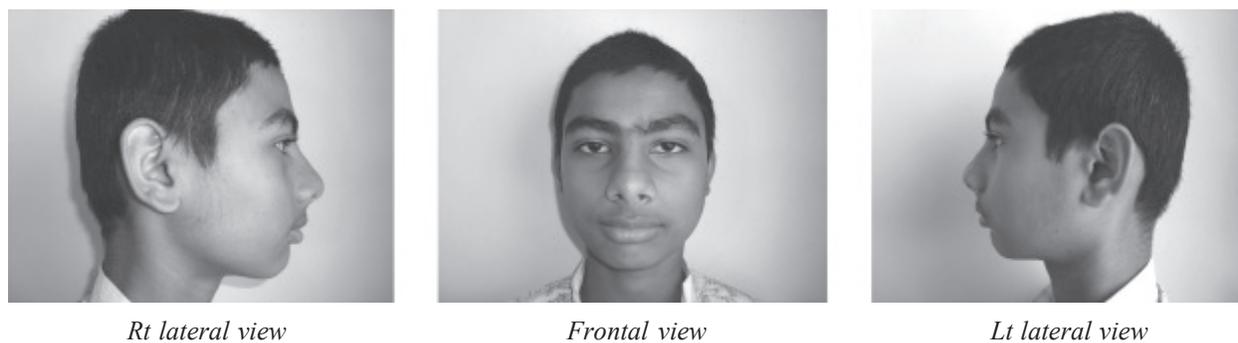


Fig.-8: Post-treatment extra-oral photographs

Discussion:

One of the most common problems in orthodontics today is Class II div-1 malocclusion. Treatment is more complicated when excess tooth material is present. This patient was treated with extraction of supernumerary teeth, deciduous teeth and light edgewise forces to produce a result that was pleasing to the patient and satisfying to the orthodontists in two years period. We did not go for lower arch treatment because the arch seemed to become normal just by extracting deciduous teeth.

Conclusion:

Analysis of final records indicated that all treatment objectives were achieved. The teeth were placed in good alignment, over bite, over jet became normal & good occlusion was maintained. A satisfactory esthetic result

had been achieved. The parent & patient's psychological satisfaction was also achieved.

References:

1. Singh G. Classification of malocclusion: Textbook of Orthodontics. 2nd ed. 159-174, 2007.
2. Hossain MZ. A clinical and practical sequence in the management of Angle Class II malocclusion: Ban J Orthod and DentofacOrthop, October 2010; Vol-1, No. 1, 27-37.
3. Tweed, C. H.: Indications for the extraction of teeth in orthodontic procedure, AM. J. ORTHOD. ORAL SURG. 30: 405-428, 1944.
4. McDougall, P. D., McNamara, J. A., Jr., and Dierkes, J. M.: Arch width development in Class II patients treated with the Fränkel appliance, AM. J. ORTHOD. 82: 10-22, 1982.
5. Proffit WR, Fields H W. , Contemporary Orthodontics. 4th ed. St Louis; Mosby; 2001.

Nonsurgical management of periapical lesion by the use of MTA based root canal sealer (MTAFillapex) - A Case Report

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Abstract:

Non-surgical treatment with proper infection control can promote healing of large periapical lesion. The success of root canal obturation is reached not only by the technique employed, but also by the type of the material chosen for treatment. Although endodontic obturation is mainly constituted by gutta-percha, endodontic sealers are used aiming to decrease the gap existing among gutta-percha points themselves and gutta-percha points and root canal walls. In this case report the patient reported that mild pain and discoloration of maxillary right central incisor. On vitality test there is no response heat and cold test. Periapical radiograph revealed widening of periodontal ligament space with loss of lamina dura and periapical radiolucency. Based on the complaint and the clinical and radiological examination, the treatment plan was root canal treatment with MTA based sealer (MTA fillapex). However a long term clinical and radiographical observation is necessary.

Key words: *Periapical lesion, Nonsurgical endodontic treatment, MTA fillapex.*

(Bangladesh Dental Journal 2014; 30: 61-64)

Introduction:

Infections of the dental pulp occur as a consequence of caries, dental operative procedures and trauma, and involve a mixed, predominately Gram-negative, anaerobic bacterial flora.¹ These infections often cause total pulpal necrosis and subsequently stimulate an immune response in the periapical region. This is commonly referred to as a periapical lesion.² Most periapical lesions can be classified as dental granulomas, radicular cysts or abscess.³ The incidence of cysts within periapical lesions varies between 6 and 55%. The occurrence of periapical granuloma ranges between 9.3% and 87.1%, and of abscesses between 28.7%

and 70.07%. There is clinical evidence that as the periapical lesions increase in size, the proportion of the radicular cysts increases. However, some large lesions have been shown to be granulomas.^{3,4}

The ultimate goal of endodontic therapy should be to return the individual teeth to a state of health and function without surgical intervention. All inflammatory periapical lesions should be initially treated with conservative non-surgical procedures. Surgical intervention is recommended only after non-surgical techniques have failed. Besides surgery has many drawbacks, which limits its use in the management of periapical lesions. A high percentage of 94.4% of complete and partial healing of periapical lesions following nonsurgical endodontic therapy has also been reported.^{5,6}

In non-surgical endodontic treatment can promote healing of large periapical lesion by cleaning, shaping and three dimensional fluid tight obturation of root canal system. Root canal sealers are used to attain impervious seal between core materials and root canal wall. They can be group according to their basic components such as zinc oxide eugenol, calcium hydroxide, glass ionomer, resin, iodoform, silicon and recently MTA fillapex (MTA based) root canal sealer, and Biodentine sealer.^{2,4}

MTA fillapex has good physical characteristics and is biocompatible. It also provides a very good seal has excellent marginal adaptation and maintain a high pH for a long period of time. Several studies specify mineral trioxide aggregate (MTA) as an effective root canal sealers.

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Case Report:

A 45 years old male patient Mr. Abdul Alim came to the department of conservative dentistry and endodontics, BSMMU, with chief complaint of pain of maxillary right central incisor. He gave a history of trauma on that tooth 7 years ago.

On extra-oral examination no abnormalities were detected. Intra-oral examination revealed discoloration of maxillary right central incisor. On palpation, patient felt mild pain on root area of affected tooth. On percussion, dull percussion note was present. On vitality test there is no response heat and cold test. Periapical radiograph revealed periapical radiolucency and widening of periodontal ligament space with loss of lamina dura.

Diagnosis:

Considering the history, clinical and radiological examination it was diagnosed as chronic periapical periodontitis.

Treatment plan:

Conventional root canal treatment by the use of MTA based root canal sealer (MTA Fillapex) followed by permanent restoration and porcelain crown was planned.

Treatment Procedure:

After proper counseling, the consent of the patient was taken and mouth preparation was done. A straight line access cavity was prepared with maintain the standard protocol. Coronal necrosed tissue remnants was removed. After negotiation of the canal patency was checked (no-20K file) and the working length was determined by radiographic method. The working length was established 22mm. Biomechanical preparation of the canal was done with standardized technique upto 70 no. k file and irrigated with 2.5% sodium hypochlorite (NaOCl) and ethylenediamine tetra acetic acid (EDTA). The canal was dried with a sterile paper point. Calcium hydroxide $\text{Ca}(\text{OH})_2$ was placed in the canal for 7 days as an intracanal medicament using lentulospiral. The access opening was sealed well with glass ionomer filling material. Patient was advised to revisit after one week.

During recall visit repeated copious irrigation was done with normal saline followed by sodium hypochlorite to remove all the $\text{Ca}(\text{OH})_2$ paste properly.

Reclean the canal walls and remove the smear layer again with liquid EDTA and then use of 2% chlorhexidine. Canal was dry with sterile paper point. Manufacturer's instructions was followed for mixing the sealer. Fillapex was coated in canal walls using lentulospirals in a slow

speed hand piece. Obturation was performed with Gutta-percha cones and sealed by lateral compaction technique. The access cavity was filled with glass ionomer cement. The patient was advised for follow up 3, 6 and 12 months. Clinical and radiological examination was taken during every follow up. Radiograph was taken by using X-ray holder to maintain the angulation and position.

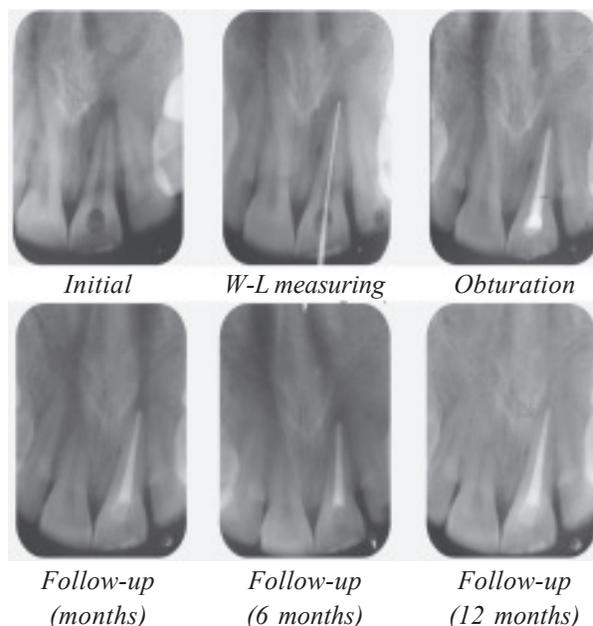


Fig.-1: Obturation of 21 no. tooth with MTA fillapex

Discussion:

Invasion of microorganisms into the pulp is responsible for the pathogenesis and necrosis of the vital pulp tissue. After the pulp becomes necrotic or nonvital, bacterial growth can be sustained within the canal. When the bacterial toxins from this infection extend into the periodontal ligament space, the tooth may become symptomatic to percussion or exhibit spontaneous pain. Radiographic changes may occur, ranging from a thickening of the periodontal ligament space to the appearance of a periapical radiolucent lesion.^{3,4}

A hermetic 3-dimensional filling must avoid leakage from the oral cavity and/or periapical tissues, thereby reducing periapical inflammation.⁷ This filling is currently achieved using a combination of endodontic sealer and gutta-percha. Gutta-percha is widely used because of its good physical and biological properties, but the lack of adhesiveness and flow makes the association with endodontic sealers necessary.^{6,8}

An ideal endodontic sealer should flow along the entire canal wall surface, fill all voids and gaps between the core

root filling material and dentin, and adhere to both dentin and gutta-percha. Inadequate filling can result in fluid movements into the filling defects favoring a periapical chronic inflammatory reaction and compromising the treatment success. Root canal ramifications, such as lateral, secondary and accessory canals can establish connection between the main root canal and periodontal ligament, as well as the apical foramen.^{9,10,11} Several authors described that localized periodontal problems might be associated with necrotic and infected root canal ramifications highlighting the importance of the capacity of the endodontic sealer to flow into these irregularities.^{12,13}

In 1999 study by Holland et al compared glassionomer root canal sealer with MTA as a sealer and concluded that MTA induces closure of main canal foramen by new cementum formation with absence of inflammatory cell after 6 months. In 2007 Holland et al examined influence of the extend of obturation on apical and periapical tissue after filling root canal with MTA and concluded that it can be used as root canal sealer. A MTA endodontic sealer (MTA fillapex, Angelus, Brazil) was recently created. According to the manufacturer, its composition after mixture is basically MTA, salicylate resin, natural resin, bismuth and silica. MTA fillapex is first paste form MTA based salicylate resin root canal sealer. Half of MTA Fillapex paste formula contains 13.2% MTA. In this MTA known for its biocompatibility, yields an impressive, hermetic seal in which MTA particles expand. The other half of MTA fillapex paste formula contains biologically compatible salicylate resin (1,3 butylene glycol disalicylate resin) which is tissue friendly and therefore a better choice over epoxy-based resins, which have mutagenic and more cytotoxic effects. MTA fillapex has antimicrobial activity against *S. aureus*, *E. coli*, *C. albicans* and *E. faecalis* by its high alkaline pH. It provide effective seal against dentin and cementum and promotes biologic repair and regeneration of periodontal ligament. They also exhibit a higher adhesiveness to dentin than conventional zinc oxide eugenol based cements and sealing ability similar to epoxy resin based cements.^{1,5,8}

Calcium hydroxide containing sealer, which stimulates apical foramen closure by mineralized tissue deposition, thus determining the biological sealing. Besides the biological characteristics, the use of the calcium hydroxide-containing root canal sealer Sealapex has been questioned regarding its predisposition to solubility and subsequent effect on the root canal seal and periradicular healing.

Zinc oxide eugenol sets because of a combination of physical and chemical reaction, yielding hardening of the mixture is due to formation of zinc eugenolate the presence of free eugenol tend to weaken the set and increased the cytotoxicity. Practically all ZOE sealer cements are cytotoxic and invoke an inflammatory response in connective tissues. Recently introduced Biodentine root canal sealer have no long lasting antibacterial action and fast setting may lead to cracks inside the hardened biodentine.^{4,17,18}

Clinical practice suggests that fluid and blood contamination in the apical region of root canal and dentin wetness (water into dentinal tubules) may be expected in teeth with apical resorption or immature apices and after poor root canal shaping. So this humid environment and residual moisture may affect the sealing of conventional hydrophobic root canal sealers and the effect bonding to a wet substrate such as root dentine remains a challenge. Otherwise MTA fillapex is not sensitive to moisture and blood contamination.^{5,14,15}

So consideration of all sealers, MTA fillapex sealer was used in this case and follow up was taken after 3, 6 and 12 month. There was no sign and symptom on clinical examination. Radiograph showing complete healing of periapical lesion.

Conclusion:

It is generally accepted that after complete debridement and disinfection, total obliteration of the root canal system will be performed with biocompatible materials. In this respect, the choice of a sealer will influence the outcome of endodontic therapy. MTA Fillapex could be used as root canal sealer with high biocompatibility compared with other sealers. In addition more scientific studies on MTA Fillapex are therefore absolutely necessary.

References:

1. Sundqvist, G., (1994). Taxonomy, ecology and pathogenicity of the root canal flora. *Journal of Oral Surg Oral Med Oral Pathol*, 78, 522-530.
2. Sydney GB, Ferreira M, Deonizio MDA, Leonardi DP, Batista(2009) A. Análise do perfil de escoamento de seiscimentos endodônticos. *RGO*. 57(1):7-11
3. Torabinejad, M. and Walton, R.E., (2002). Periradicular lesion. In: J.I. Ingle and L.K. Blackland, ed. *Endodontics*. 5th ed. Hamilton Ontario, Canada : B.C. Decker, 175-201
4. Bhaskar, S.N., 1966. Periapical lesion- types, incidence and clinical features. *Journal of Oral Surgery Oral Medicine Oral Pathology*, 21, 657-670

5. Bogen G, Kuttler S 2009. Mineral trioxide aggregate obturation: A review and case series. *J Endod* 35:777-90.
6. Camps J, Pommel L, Bukiet F, About I (2004). Influence of the powder/liquid ratio on the properties of zinc oxide-eugenol-based root canal sealers. *Dent Mater*. 20:915-23.
7. De Almeida WA, Leonardo MR, TanomaruFilho M, Silva LA (2000) Evaluation of apical sealing of three endodontic sealers. *IntEndod J*. 33:25-7.
8. Duarte MAH, Ordinola-Zapata R, Bernardes RA, Bramante CM, Bernardineli N, Garcia RB et al (2010) Influence of calcium hydroxide association on the physical properties of AH Plus. *J Endod*.;36(6):1048-50.
9. Gomes-Filho JE, Watanabe S, Bernabé PF, de Moraes Costa MT (2009). A mineral trioxide aggregate sealer stimulated mineralization. *J Endod*. 35:256-60.
10. Holland R, de Souza V, Nery MJ, OtoboniFilho JA, Bernabé PF, Dezan E., Júnior (1999) Reaction of dogs' teeth to root canal filling with mineral trioxide aggregate or a glass ionomer sealer. *J Endod*. 25:728-30.
11. Hoshino, E., Kurihara, N.A., Satol, U.H., Sato, M., Kotak, et.al., (1996). In vitro antibacterial susceptibility of bacteria taken from infected root dentine to a mixture of Ciprofloxacin, Metronidazole, Minoclicin in situ. *International Endodontic Journal*, 29 ,125-130.
12. Lee SJ, Monsef M, Torabinejad M (1999). Sealing ability of a mineral trioxide aggregate for repair of lateral root perforations. *J Endod*. 19:541-4.
13. Mickel AK, Wright ER (1999) Growth inhibition of *Streptococcus anginosus* (milleri) by three calcium hydroxide sealers and one zinc oxide-eugenol sealer. *J Endod*. ;25:34-7
14. Moraes SH, Zytkevitz E, Ribeiro JC, Heck AR, Aragão EM (1989). Cimentosendodônticos: tempo de presa e escoamento de dois cimentos obturadores de canais radiculares. *RGO*. Nov-Dec;37(6):455-9.
15. Nair, P.N.R., (1998). New perspective on radicular cyst: do they heal? *International Endodontic Journal*
16. Negm MM, Lilley JD. A(1985) study of the viscosity and working time of resin-based root canal sealers. *J Endod*. Oct;11(10):442-5.
17. Saatchi, M., (2007). Healing of large periapical lesion: A non surgical endodontic treatment approach. *Australian Endodontic Journal*, 33, 136-140.
18. Simon J.H.S., (1980). Incidence of periradicular cyst in relation to the root canal. *Journal of Endodontics*, 6, 845-84

Occupational risk and Hepatitis B in Dentistry: Review

Dastagir S

Abstract

Health-care workers have an occupational risk of infection with hepatitis B virus (HBV). As dental healthcare professionals have numerous patients and they are very much exposed to blood, are likely to have the maximum risk. HBV is transmitted by skin prick with infected, contaminated needles and syringes or through accidental inoculation of minute quantities of blood during surgical and dental procedures. In a dental clinic infections can be expedited through several routes, including direct or indirect contact with blood, oral fluids, droplet splatter, etc. The aim of the present review is to increase the awareness among dental practitioners, so as to reduce the burden of hepatitis in their community. A meticulous review of the literature was carried out, which engaged most of the articles published in peer-reviewed journals relating to the subject of hepatitis B and occupational risk in dentistry. The review itself began with the search of relevant key words like hepatitis B, dentistry, occupational risk, and infection control in various search engines including PubMed, Medline. The results revealed that the dentists were among the high-risk groups for hepatitis, and they have little information on the factors associated with adherence to hepatitis B vaccination. HBV can be prevented by strict adherence to standard microbiological practices and techniques, and routine use of appropriate barrier precautions to prevent skin and mucous membrane exposure when handling blood and other body fluids of all dental patients and pre-exposure vaccines. .

Keywords: Dentist, hepatitis, occupational risk, infection control.

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Introduction

Hepatitis is a major public health problem worldwide.¹ Seven types of the hepatitis virus have been identified and are named as hepatitis A to G, of which; F is hypothetical.² Hepatitis B remains the most serious type with a high risk of death from liver cirrhosis and cancer.² Hepatitis B virus (HBV) is a DNA virus with a human, the only reservoir. About one-third of the world's population, which accounts to 2 billion people, have been infected with HBV.³ This virus can survive outside the body for at least 7 days and the incubation period is about 21-135 days.⁴ Overall, approximately 45% of the global population lives in areas of high chronic HBV prevalence.⁵ In Sub-Saharan Africa, the Pacific, and particularly Asia, HBV infection is highly endemic, with the majority of individuals are infected during childhood only.⁶

The incubation period is 30-180 days. Chronic infection with HBV may be either asymptomatic or may be associated with a chronic inflammation of the liver (chronic hepatitis), leading to cirrhosis over a period of several years.⁷

At the beginning of the third millennium, hepatitis B virus (HBV) remains a major global public health problem. More than a third of people have been infected worldwide, and of these, 350–400 million are chronically infected². In a study on the global challenge of HBV, the dental community had the highest risk of infection amongst all health care personnel. Based on Cottone's study³ dentists and oral surgeons were in the first rank, nurses, dental hygienists and assistants were in the third rank, and dental students and dental laboratory technicians were in the sixth and seventh ranks, respectively.³ A previous survey⁴ in the prevaccination era showed that HBV infection of dentists was approximately 3–6 times greater than that of the general population. Nonetheless, despite extensive vaccination programs against HBV.

Since 1989, this infection has not yet been fully eradicated, and still is a major concern in dental fields.⁴ Most investigators believe that dentists acquire the virus through a cut in the fingers contaminated by the patient's blood or saliva. Most dentists experience a needle stick or needle puncture of a finger at least once a week, mostly during recapping syringes and cleaning of instruments. Transmission of blood-borne pathogens following an exposure depends on the concentration of the virus in the

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blood or body fluid, the volume of infective material inoculated, the loss of infectivity during transfer of the inoculated material and the port of entry. The annual cumulative HBV infection risk of routine treatment of patients whose seropositivity is undisclosed is nearly 60 times greater than of human immunodeficiency virus (HIV) and mortality risk of HBV infection is 1.7 times greater than of HIV. Hence, greater attempt to restrict HBV exposure is required.⁴

Search strategy

The review itself began with the search of relevant key words like hepatitis B, dentistry, occupational risk, and infection control in various search engines including PubMed, Medline (published between January 2000 and December 2015). Manual search of various journals and books was also carried out. All the searched articles were not included, only highly relevant articles from English literature were considered for the present review.

Epidemiology of Hepatitis B in Dental Practitioners:

Since 1989, extensive vaccination programs against HBV are going on, but this infection has not yet been fully eradicated. In the field of dentistry still it is a great concern.⁵ The incidence of HBV infection began to decrease, in the past few years, because of the availability of HBV vaccine. But this incidence is still higher than in the general population.⁶ There are two studies from Brazil discussed regarding HBV infection in dentistry. One study revealed that 10.8% of 474 dentists were seropositive for HBV infection. Three dentists (0.6%) were HBsAg positive, and 43 (9.1%) were anti-HBc/anti-HBs positive.⁷ According to second study among 135 dentists, one dentist (0.7%) was positive for HBsAg. Eleven dentists (8.1%) had anti-HBs and anti-HBc in their serum samples.⁸ According to several studies, the incidence of HBV infection increases with the length of clinical practice of dentists.⁹ dentists age, irregular use of protective glasses and clothing^{9,10,11,12} and presumed contact with infected blood.¹¹ In Canada and in USA, 101 dental anesthesiologists completed a questionnaire regarding percutaneous and mucocutaneous injuries. The calculated annual risk of acquiring HBV, HCV and HIV from percutaneous and mucocutaneous injuries was <0.2%. In Canada, the risk of acquiring HBV in nonimmune dental anesthesiologists was 150 times greater than the risk of acquiring HIV. In the USA, the risk of acquiring HBV in nonimmune dental anaesthesiologists was 50 times greater than the risk of acquiring HIV.¹³ The evidence for viral transmission in dental offices is based on the results of seroprevalence studies, epidemiological investigations and case reports.

It should be mentioned that many cases of infection transmission are not documented, because approximately 50% of infections are subclinical, there is difficulty in linking isolated sporadic cases with a HCW and the variation in completeness of surveillance among jurisdictions.¹⁴ It is a sad fact that HBV infection shows a higher prevalence in hospitalized dental patients than the general population.¹⁵ There are still three problems that hinder decisions regarding HBV infection in dentistry. The first problem is that there is insufficient data on HBV infection incidence among dentists and related communities, for that reason it is currently difficult to make conclusions on its prevalence in these subjects.

The second problem is that existing studies are normally conducted with a blood sample from one venipuncture. It appears that dentists, who knew they were infected with HBV, did not participate in the survey.¹⁰

The third one is that, different methods have been used to evaluate rates of HBV infection, so it is difficult to compare the results in the various studies.¹⁶

Recommended infection-control practices for Dentistry

A common set of infection-control strategies should be effective for preventing hepatitis B viruses.^{16,17} The ability of hepatitis B virus to survive in the environment¹⁸ and the high titers of virus in blood¹⁹ make this virus a good model for infection-control practices to prevent transmission of a large number of other infectious agents by blood or saliva. Because all infected patients cannot be identified by history, physical examination, or readily available laboratory tests.¹⁷ The following recommendations should be used routinely in the care of all patients in dental practices.

Medical History

Always obtain a thorough medical history. Include specific questions about medications, current illnesses, hepatitis, recurrent illnesses, unintentional weight loss, lymphadenopathy, oral soft tissue lesions, or other infections. Medical consultation may be indicated when a history of active infection or systemic disease is elicited.

Use of Protective Attire and Barrier Techniques

1. For protection of personnel and patients, gloves must always be worn when touching blood, saliva or mucous membranes.^{20,21} Gloves must be worn when examining all oral lesions. All work must be completed on one patient, where possible and the hands must be washed and regloved before performing procedures on another patient. Repeated use of a single pair of gloves is not recommended,

since such use is likely to produce defects in the glove material, which will diminish its value as an effective barrier.

2. Surgical masks and protective eyewear or chin-length plastic face shields must be worn when splashing or spattering of blood or other body fluids is likely, as is common in dentistry.^{22,23}

3. Reusable or disposable gowns, laboratory coats, or uniforms must be worn when clothing is likely to be soiled with blood or other body fluids. If reusable gowns are worn, they may be washed, using a normal laundry cycle. Gowns should be changed at least daily or when visibly soiled with blood.²⁴

Handwashing And Care of Hands

Hands must always be washed between patient treatments contacts (following removal of gloves), after touching inanimate objects likely to be contaminated by blood or saliva from other patients, and before leaving the operatory. The rationale for hand washing after gloves have been worn is that gloves become perforated, knowingly or unknowingly, during use and allow bacteria to enter beneath the glove material and multiply rapidly. For many routine dental procedures, such as examinations and nonsurgical techniques, hand washing with plain soap appears to be adequate, since soap and water will remove transient microorganisms acquired directly or indirectly from patient contact.²² For surgical procedures, an antimicrobial surgical handscrub should be used.²³

Use And Care of Sharp Instruments and Needles

1. Sharp items (needles, scalpel blades, and other sharp instruments) should be considered as potentially infective and must be handled with extraordinary care to prevent unintentional injuries.

2. Disposable syringes and needles, scalpel blades, and other sharp items must be placed into puncture-resistant containers located as close as practical to the area in which they were used. To prevent needle stick injuries, disposable needles should not be recapped; purposefully bent or broken; removed from disposable syringes; or otherwise manipulated by hand after use.

3. Recapping of a needle increases the risk of unintentional needle stick injury. There is no evidence to suggest that reusable aspirating-type syringes used in dentistry should be handled differently from other syringes. Needles of these devices should not be recapped, bent, or broken before disposal.

4. Because certain dental procedures on an individual patient may require multiple injections of anesthetic or

other medications from a single syringe, it would be more prudent to place the unsheathed needle into a “sterile field” between injections rather than to recap the needle between injections. A new (sterile) syringe and a fresh solution should be used for each patient.

Use And Care of Ultrasonic Scalers, Handpieces and Dental Units

Routine sterilization of hand pieces between patients is desirable; however, not all hand pieces can be sterilized. After use, the hand piece should be flushed, then thoroughly scrubbed with a detergent and water to remove adherent material. It should then be thoroughly wiped with absorbent material saturated with a chemical germicide that is registered with the EPA as a “hospital disinfectant” and is mycobactericidal at use-dilution.²⁴ The disinfecting solution should remain in contact with the hand piece for a time specified by the disinfectant’s manufacturer. Ultrasonic scalers and air/water syringes should be treated in a similar manner between patients. Following disinfection, any chemical residue should be removed by rinsing with sterile water.

Disposal of Waste Materials

All sharp items (especially needles), tissues or blood should be considered potentially infective and should be handled and disposed of with special precautions. Disposable needles, scalpels, or other sharp items should be placed intact into puncture-resistant containers before disposal. Blood, suctioned fluids or other liquid waste may be carefully poured into a drain connected to a sanitary sewer system. Other solid waste contaminated with blood or other body fluids should be placed in sealed, sturdy impervious bags to prevent leakage of the contained items. Such contained solid wastes can then be disposed of according to requirements established by local or state environmental regulatory agencies and published recommendations.^{21,23}

Reference:

1. Tripathi S, Kamala BK, Kiran K. Hepatitis B awareness among the dental professionals, students and dental hygienists in a dental school - An epidemiological study. *Int J Contemp Dent* 2011;2:45-50.
2. Kasetty S, Mohania A, Dwivedi D, Tijare M, Kallianpur S, Gupta S. A Cross-sectional study on the knowledge of hepatitis B infection among dental professionals. *J VirolMicrobiol* 2013;2013:288280.
3. Cottone JA. The global challenge of hepatitis B: implications for dentistry. *Int Dent J* 1991; 41(3): 131-141.
4. Sharma R, Sharma CL, Khajuria R. The knowledge, attitude and practices regarding HBV infection of married women in

- reproductive age group living in cantonment area, Sunjawan, Jammu. *JK Sci* 2004;6:127-30.
5. Mahoney FJ. Update on diagnosis, management, and prevention of hepatitis B virus infection. *ClinMicrobiol Rev* 1999;12:351-66.
 6. World Health Organization. Hepatitis B Fact Sheets; 2000. Available from: <http://www.who.int/mediacentre/factsheets/fs204/e>. [Last cited on 2012 Aug 25].
 7. Elmukashfi TA, Ibrahim OA, Elkhidir IM, Bashir AA, Elkarim MA. Hazards analysis, within departments and occupations, for hepatitis B virus among health care workers in public teaching hospitals in Khartoum state; Sudan. *Glob J Health Sci* 2012;4:51-9.
 8. Martins AM, Barreto SM. [Hepatitis B vaccination among dentists surgeons]. *R SaudPublica* 2003; 37(3): 333-338.
 9. Alavian SM, Izadi M, Zare AA, Moghani-Lankarani M, Assari S, Vardi MM. Survey of the level of anti-HBs antibody titer in vaccinated Iranian general dentists. *Spec Care Dentist* 2008; 28(6): 265-270.
 10. Cleveland JL, Siew C, Lockwood SA, Gruninger SE, Gooch BF, Shapiro CN. Hepatitis B vaccination and infection among U.S. dentists, 1983-1992. *J Am Dent Assoc* 199; 127(9): 1385-1390.
 11. Suljak JP, Leake JL, Haas DA. The occupational risk to dental anesthesiologists of acquiring 3 bloodborne pathogens. *AnesthProg* 1999; 46(2): 63-70.
 12. McCarthy GM. Risk of transmission of viruses in the dental office. *J Can Dent Assoc* 2000; 66(10): 554-555.
 13. Shaw D. Dentistry and the ethics of infection. *J Med Ethics* 2008; 34(3): 184-187.
 14. McCarthy GM, MacDonald JK. Improved compliance with recommended infection control practices in the dental office between 1994 and 1995. *Am J Infect Control* 1998; 26(1): 24-28.
 15. Al-Khatib IA, Ishtayeh M, Barghouty H, Akkawi B. Dentists' perceptions of occupational hazards and preventive measures in East Jerusalem. *East Mediterr Health J* 2006; 12(1-2): 153-160.
 16. Al-Omari MA, Al-Dwairi ZN. Compliance with infection control programs in private dental clinics in Jordan. *J Dent Educ* 2005; 69(6): 693-698.
 17. Takata Y, Kurokawa H, Fukuda J. Transfusion transmitted virus (TTV) in dental patients. *Int J Oral Maxillofac Surg* 2003; 32(2): 184-187. Crawford JJ. State-of-the-art practical infection control in dentistry. *J Am Dent Assoc* 1985;110:629-33.
 18. CDC. Acquired immunodeficiency syndrome (AIDS): precautions for health-care workers and allied professionals. *MMWR* 1983;32:450-1.
 19. Bond WW, Favero MS, Petersen NJ, Gravelle CR, Ebert JW, Maynard JE. Survival of hepatitis B virus after drying and storage for one week {Letter}. *Lancet* 1981;I:550-1.
 20. Shikata T, Karasawa T, Abe K, et al. Hepatitis B e antigen and infectivity of hepatitis B virus. *J Infect Dis* 1977;136:571-6.
 21. Hadler SC, Sorley DL, Acree KH, et al. An outbreak of hepatitis B in a dental practice. *Ann Intern Med* 1981;95:133-8.
 22. Occupational Safety and Health Administration. Risk of hepatitis B infection for workers in the health care delivery system and suggested methods for risk reduction. U.S. Department of Labor 1983;(CPL 2-2.36).
 23. CDC. Hepatitis B among dental patients — Indiana. *MMWR* 1985;34:73-5. Manzella JP, McConville JH, Valenti W, Menegus MA, Swierkosz EM, Arens M. An outbreak of herpes simplex virus type 1 gingivostomatitis in a dental hygiene practice. *JAMA* 1984;252:2019-22.
 24. Petersen NJ, Bond WW, Favero MS. Air sampling for hepatitis B surface antigen in a dental operator. *J Am Dent Assoc* 1979;99:465-7.

The antibacterial & therapeutic effects of green tea on oral & periodontal health - A review

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Abstract:

Green tea is one of the most ancient & popular beverages and is considered as a healthful beverage due to the biological activity of its polyphenols. This product is made from the leaf of the small bushy plant called "Camellia sinensis". It can be consumed as a drink which has many beneficiary systemic health effects or, it can be used as medicine by making green tea "Extract" from leaves. According to literatures, green tea contains a thousand of bioactive compounds amongst which polyphenols play an important role to prevent & treat various diseases. Green tea polyphenols are named "catechins". Among the polyphenols; EpigalloCatechin-3-gallate (EGCg) & EpiCatechin-3-Gallate (ECg) are the most predominant catechins. Green tea polyphenols can play an important role to fight cavity producing effects of Streptococcus mutans by destroying them, reducing ability of Streptococcus mutans to produce the enamel damaging acid & inhibiting production of plaque by making tooth surface slippery, so that bacteria can't adhere to the tooth. The exact mechanism by which green tea can prevent dental caries is yet to known, but certain theories like bactericidal effects of green tea against Streptococcus mutans & prevention of bacterial adherence to teeth have been suggested. The aim of this present review is to describe antibacterial properties of the "Green Tea" along with medicinal properties on oral & periodontal health. In this review, first we introduced some information regarding plant morphology & active ingredients of tea. Then, we described some of the important oral & periodontal diseases along with the effect of green tea & its supplements to improve them in brief.

Keywords: Green Tea, Catechins, Teeth, Caries, Periodontal Health.

(Bangladesh Dental Journal 2014; 30: 69-81)

Introduction:

Since ancient times, plants have been an exemplary source of medicine. According to Ayurveda and other ancient Indian literatures, plants are used in treatment of various human diseases. Indian subcontinent is one of the oldest civilizations which is known for rich repository of medicinal plants. Traditional system of medicine is found to have utilities as many accounts. Due to population rise adequate supply of drug and high cost of treatment in side effect along with drug resistance has been encountered in synthetic drugs, which has lead to an elevated emphasis for the use of plants to treat human diseases. The affordability of herbals has also drawn the attraction towards their use.¹ Plant extracts have been widely used in topical and oral applications for disease treatment. Examples of these include ginkgo biloba, echinacea, ginseng, grape seed, green tea, lemon, lavender, rosemary,

thuja, sara, allantoin, fever wort, blood root, apache plume, papaya, and tragacanth.² Black tea is the second most commonly drunk liquid on earth after water. Green tea "Camellia sinensis", which is not fermented at all during the drying process, has numerous medicinal benefits mainly due to its antibacterial and antioxidant properties.³ In oriental cultures, it has been widely believed for a long time that tea has medicinal efficacy in the prevention and treatment of many diseases. Compounds present in both green and black teas have been shown to inhibit the growth and activity of bacteria with tooth decay producing halitosis.^{4,5} Tooth decay is the gradual breakdown of the tooth beginning with the enamel surface and eventually progressing to the inner pulp. Tooth decay and, eventually, halitosis are caused by acids produced by certain mouth bacteria in dental plaque. Factors that affect this process include oral hygiene, diet meal frequency, saliva production, and heredity. Teeth with significant decay are said to have caries or cavities.^{4,6-7} Studies indicate dental caries is associated with modern civilization, since primitive isolated tribes are relatively caries-free. The malefic bacteria in our mouths can cause tooth decay and bad breath (halitosis). Carbohydrates play an important role in the

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development of dental caries, especially when it remains on tooth structure for significant period of time.⁽⁸⁻⁹⁾ Fermentation of carbohydrates by bacteria mainly *Streptococcus mutans* results in a decrease in the pH of plaque and demineralization of enamel and finally formation of dental caries.¹⁰⁻¹³ Plaque is another contributor to bad breath. Bad breath is caused by anaerobic sulfur producing bacteria that normally live on the surface of the tongue and in the throat. These bacteria are supposed to be there because they assist humans in digestion by breaking down the proteins found in specific foods, mucous, phlegm, blood, and diseased or “broken-down” oral tissues. Under certain conditions, these bacteria start to break proteins down at a very high rate. Proteins are made up of amino acids; two amino acids, cysteine and methionine, are dense with sulfur. When these “beneficial” bacteria come into contact with these compounds, the odorous and “lousy-tasting” sulfur compounds are released from the back of the tongue and throat as hydrogen sulfide, methyl mercaptan, and other odorous and bad tasting compounds. These “problem” compounds are often referred to as volatile sulfur compounds. Based on one article, the phenolic compound in green tea may block the growth of bacteria responsible for teeth cavity and plaque formation.¹⁴

History of tea

The history of tea is long and complex, spreading across multiple cultures over the span of thousands of years. Tea likely originated in southwest China during the Shang dynasty as a medicinal drink.¹⁵ An early credible record of tea drinking dates to the 3rd century AD, in a medical text written by Hua Tuo.¹⁶ Tea was first introduced to Portuguese priests and merchants in China during the 16th century.¹⁷ In one popular Chinese legend, Shen-nong, the legendary Emperor of China and inventor of agriculture and Chinese medicine was drinking a bowl of just boiled water due to a decree that his subjects must boil water before drinking it.¹⁸ Some time around 2737 BC, when a few leaves were blown from a nearby tree into his water, changing the color. The emperor took a sip of the brew and was pleasantly surprised by its flavor and restorative properties. A variant of the legend tells that the emperor tested the medical properties of various herbs on himself, some of them poisonous, and found tea to work as an antidote.¹⁹ Shennong is also mentioned in Lu Yu’s famous early work on the subject, *The Classic of Tea*.²⁰ A similar Chinese legend goes that the god of

agriculture would chew the leaves, stems, and roots of various plants to discover medicinal herbs. If he consumed a poisonous plant, he would chew tea leaves to counteract the poison.

Historically, Bengal was the terminus of the Tea Horse Road connecting the subcontinent with China’s early tea-growing regions in Yunnan. Atisa is regarded as one of the earliest Bengali drinkers of tea.²¹ Black tea cultivation was introduced in Bengal during the British Empire.²² European traders established the first subcontinental tea gardens in the port city of Chittagong in 1840, when plantations were set up beside the Chittagong Club using Chinese tea plants from the Calcutta Botanical Garden.^{21,23} The first home-grown tea was made and tasted near the Karnaphuli River in Chittagong in 1843.^{23,21} Commercial cultivation of tea began in the Mulnicherra Estate in Sylhet in 1857.²¹



Fig.-1: Fresh leaves of Green Tea

Morphology of tea

Chinese *Camellia sinensis* is native to mainland China, South and Southeast Asia, but it is today cultivated across the world in tropical and subtropical regions. Tea is a commonly consumed beverage. An oriental evergreen tree that can reach a height of thirty feet in the wild, the tea plant is pruned to a height of about three feet to promote new growth and easy plucking. The tea plant (botanical name-*Camellia sinensis*) produces abundant foliage, a camellia like flower and berries containing one to two seeds. Only the two leaves and bud at the tip of each new shoot are picked for tea.²⁴ (Figure 1).

Classification of tea

Green tea, Oolong and black tea come from the leaves of the plant *Camellia sinensis*; however the processing that the leaves undergo to make the final tea is different. The leaves for black tea are fully oxidized and for oolong tea are partially oxidized, while those for green teas are lightly steamed before being dried.

Depending on the manufacturing process, teas are classified into 3 major types: (Figure 2)

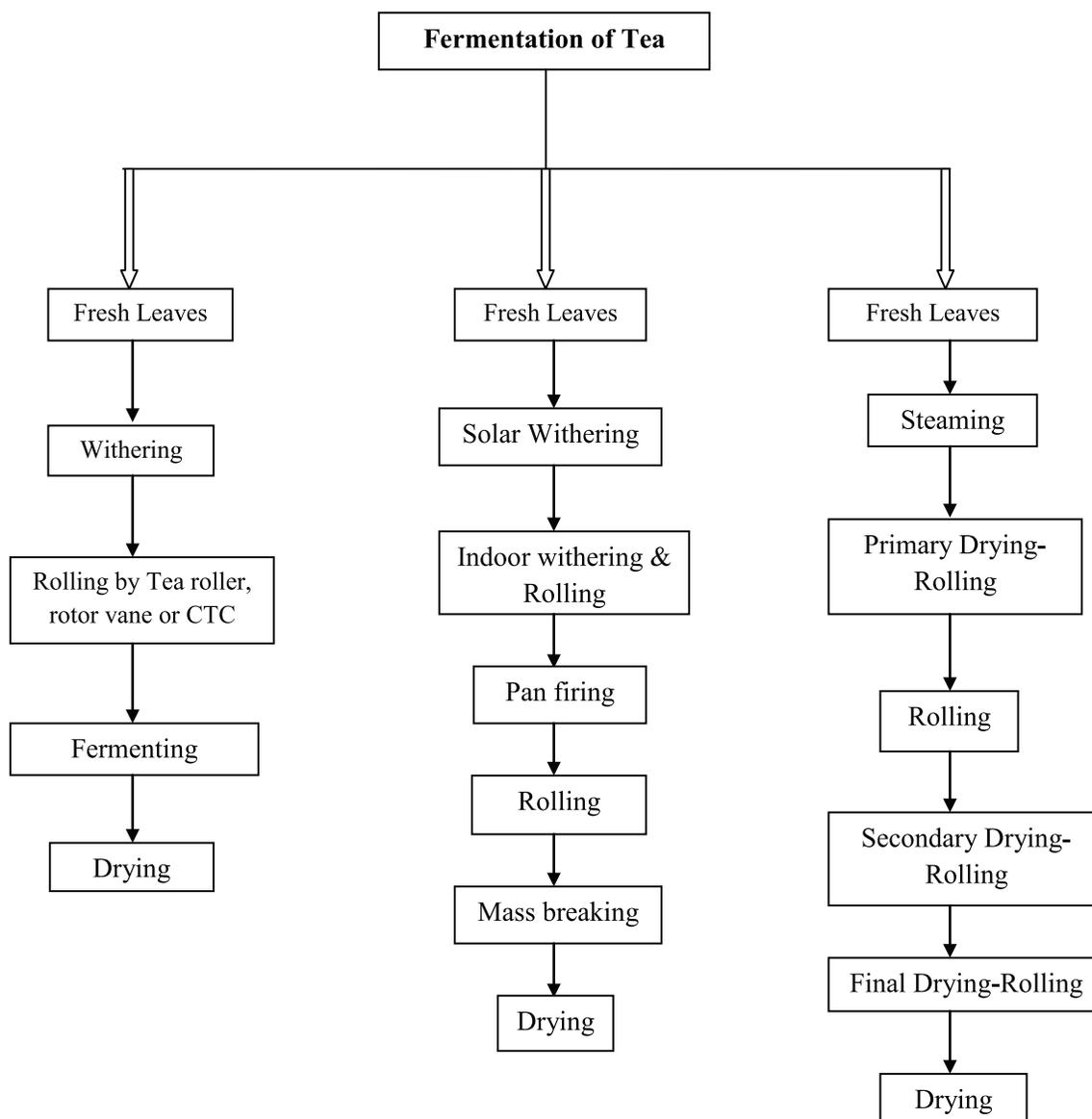


Fig. -2: Fermentation of Tea: The manufacturing processes of tea: (A) black tea; (B) oolong tea; and (C) green tea.

What does a tea leaf contain?

Tea is reported to contain nearly 4000 bioactive compounds of which one third is contributed by polyphenols.⁽²⁵⁾ Other compounds are alkaloids (caffeine, theophylline and theobromine), amino acids, carbohydrates, proteins, chlorophyll, volatile organic compounds (chemicals that readily produce vapors and contribute to the odor of tea), fluoride, aluminum, minerals and trace elements.⁽²⁶⁾

Fresh-cut tea leaves consist of 75-80% water. A variety of green tea flavors are formed through the combination of three main taste components.

Catechin–Bitterness & Astringency;

Caffeine–Bitterness;

Theanine & Amino Acids–Flavor & Sweetness.⁽²⁷⁾ (Figure 3)

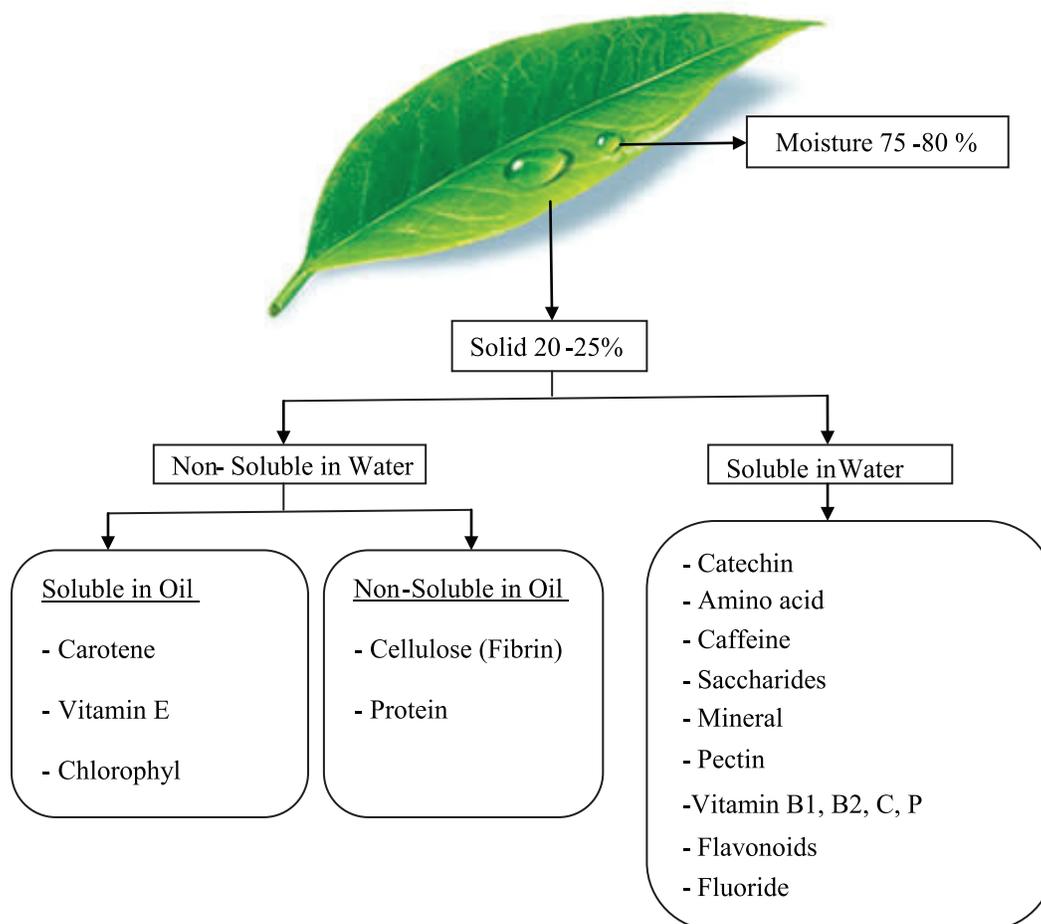


Fig.-3: Contents of tea leaf

Tables-I and Table-II provides average values for the different constituents present in green and black tea although they will differ dependent on the variety of leaf, growing environment, manufacturing, particle size of ground tea leaves and infusion preparation.⁽²⁸⁻²⁹⁾

Table-I
Principle components of black tea⁽³⁰⁾

	Black Tea (% weight of extract solids)
Catechins	3-10
Theaflavins	3-6
Thearubigens	12-18
Flavonols	6-8
Phenolic acids and depsides	10-12
Amino Acids	13-15
Methylxanthines	8-11
Carbohydrates	15
Protein	1
Mineral water	10
Volatiles	<0.1

Table-II
Principle components of green tea⁽³⁰⁾

	Green Tea(% weight of extract solids)
Catechins	30-42
Flavonols	5-10
Other flavonoids	2-4
Theogallin	2-3
Other depsides	1
Ascorbic Acid	1-2
Gallic Acid	0.5
Quinic acid	2
Other organic acids	4-5
Theanine	4-6
Other amino acids	4-6
Methylxanthines	7-9
Carbohydrates	10-15
Minerals	6-8
Volatiles	0.02

The chemical history of tea:

While the history of tea drinking is ancient, investigation into the chemical components of tea is in comparison quite recent. Tea is composed of unique constituents among other plants. Caffeine is found only in a few other plants other than tea. Theanine, which is unique to tea, is a kind of amino acid constituting more than half the total amount of amino acids in tea. Major catechins in tea are also unique to tea. Vitamin C was found to be contained in tea after it was discovered in lemons. Tea aroma is an area that attracted the interest of scientists who had been seeking one single compound that represents tea, a search which has yet been in vain. In 1827 caffeine was discovered in tea. At that time it was given the name theanine, but when it was proven that the structure and properties of this substance were exactly the same as caffeine that was identified in coffee in 1820, the name theanine was dropped. In 1924, vitamin C was discovered in green tea by two Japanese scientists, M. Miura and M. Tsujimura, under Professor U. Suzuki. The astringency of tea, too, was investigated extensively by Tsujimura. In the years 1927 to 1935.

Tsujimura isolated epicatechin, epicatechin gallate, and epigallo catechin.⁽²⁷⁾

Biosynthesis of Tea Catechins

The tea plant contains many kinds of polyphenols, Catechins being particularly prolific. Catechins belong to those groups of compounds generically known as flavonoids, which have a C6-C3-C6 carbon structure and are composed of two aromatic rings. Currently, the tea plant is known to contain seven kinds of major catechins and traces of various other catechin derivatives. (Figure 4)

They are divided into two classes:

1) The free catechins:

(+)-catechin, (+)-gallocatechin, (-)-epicatechin, (-)-epigallocatechin;

And,

2) The esterified or galloylcatechins:

(-)-epicatechingallate, (-)-epigallocatechingallate, (-)-gallocatechingallate.

While the galloylcatechins are astringent (EGCg, ECg) with a bitter after taste (ECg), free catechins have far less astringency (EGC, EC), leaving a slightly sweet aftertaste (EGC) even at 0.1% aqueous solutions.²⁷

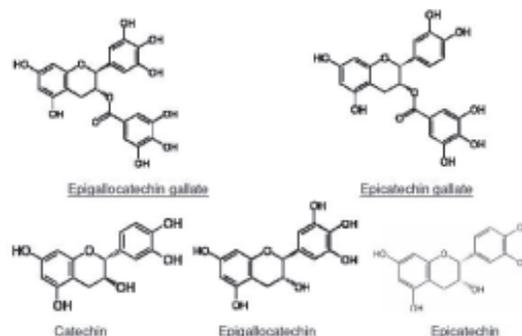


Fig.-4: Basic structures of different green tea polyphenols

This is the process of extracting polyphenolic constituent of tea leave as follows:

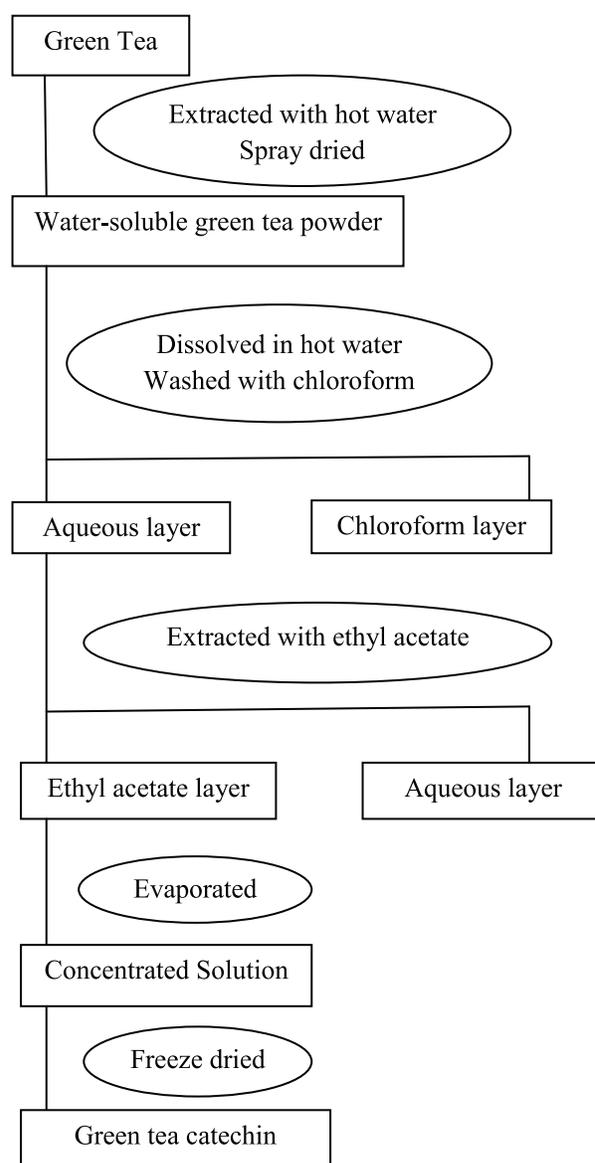


Fig. 5: The preparation of green tea catechins

Tooth Decay:

By the time the human mouth reaches maturity, most adult humans have thirty two teeth as is seen in (Figure 6). At the front of the mouth are incisors, the sharpest teeth, which are used to bite food and direct the food into the mouth. The canine teeth are located behind the incisors on either side of the mouth. They have long roots and grasp incoming food. The premolars are located even farther back into the mouth. These teeth are wide and flat, equipped for grinding food before it is fully digested. Finally, the molars grind food into particles small enough to be swallowed and broken down in human's digestive tracts. It is very important to keep all of these teeth clean, and cavities are a real concern for humans in today's society.

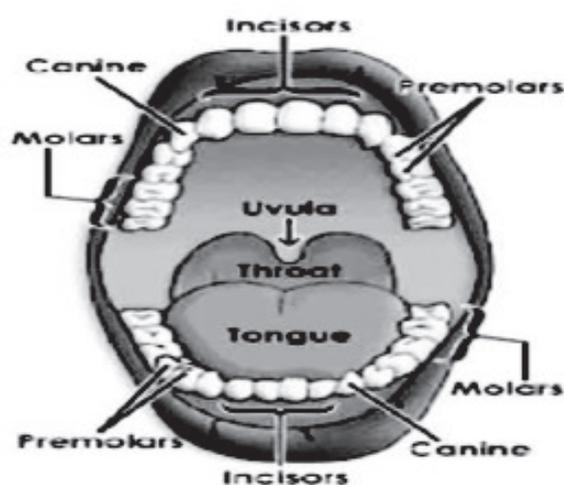


Fig.-6: Anatomy of the Human Mouth

After food enters the mouth, particles and bacteria are able to cling to the surface of the teeth. Many times, if the teeth are not brushed soon enough after eating, the bacteria can grow and form a film on the teeth. It is important to understand that cavities are not formed by the sugars consumed by humans, but instead by the bacteria that grow in the mouth if food particles remain on and between teeth for an extended period of time, (Figure 7). Certain bacteria thrive in the conditions found in the human mouth. The warm environment and constant source of food both make the teeth and gums ideal locations for bacterial cultures to grow. *Streptococcus mutans* and *Streptococcus sobrinus* are two such bacteria commonly found in dental cavities. When they grow on the surfaces of teeth, they eat at the food particles and release acid as a waste product.

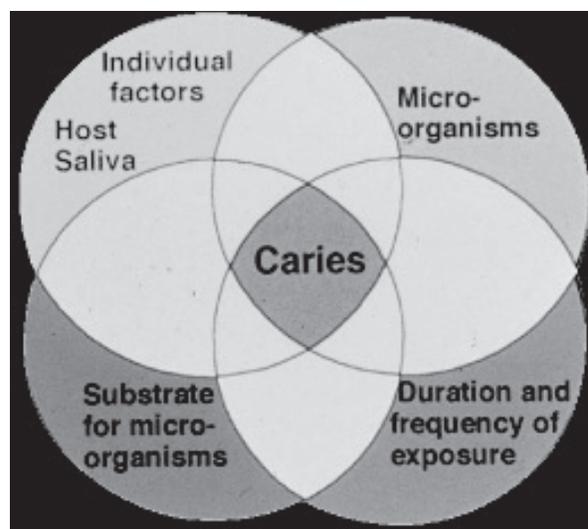


Fig.-7: Dental Caries

This acid eventually builds up, and breaks down the minerals in the teeth. Over time, when large amounts of acid have been released surrounding teeth, cavities begin to form. The acid initially leaves the surface of the tooth intact, while breaking down the enamel lying beneath the surface. When the tooth has enough damage, the surface also breaks down and a cavity is formed. The most common means to prevent tooth decay are to consistently brush and floss the teeth. Fluoride is usually present in toothpaste as a means to breakdown bacteria and prevent acid build-up. Fluoride is also present in green and black tea, one reason why drinking tea can prevent tooth decay.⁽³¹⁾

Bacterium Causing Tooth Decay

Ancient Japanese folklore tells how drinking tea leads to long life and clean teeth. At least the second part of this fable seems to be true. Recent research indicates that tea is able to counter some of the microorganisms, *Streptococcus mutans*, *Streptococcus sobrinus*, and *Lactobacillus* that can form plaque and bio-films on teeth, resulting in tooth decay. Microorganisms from the genus *Streptococcus* are gram-positive bacteria. They have a round shape and frequently grow in chains. They are anaerobes that thrive in a complex culture. *Streptococcus mutans* (Figure 8) is a species of *Streptococcus* that usually resides in the human mouth. It was discovered in 1924 by J K Clark. *Streptococcus mutans* is able to cling to the surface of teeth and feed on food particles, especially carbohydrates, that become trapped on and between teeth.

The acid released by this bacteria is the leading cause of tooth decay in the world. *Streptococcus sobrinus* is closely related to *Streptococcus mutans*, although it is less common in human beings.³²

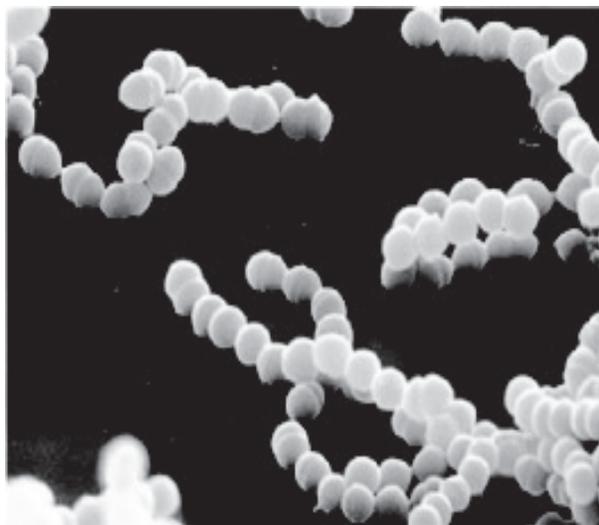


Fig.-8: Scanning electron microscope image of *Streptococcus* bacteria

Anticariogenic Effects of Green Tea Catechins:

Several studies have reported the efficacy of green tea on dental health. Tea leaves are rich in fluoride, which is known to enhance dental health and prevents dental caries. However, the possible dental health benefits of tea are not limited to fluoride, but involve other tea components. Dental caries are induced by oral microflora. Among hundreds of microorganisms in the oral cavity, only the cariogenic streptococci, especially *Streptococcus mutans*, play an important role in causing dental caries. Several green tea polyphenols have preventive effects on dental caries. Among the catechins; gallic catechin (GC) and epigallocatechin (EGC) are most active, inhibiting the growth of 10 strains of cariogenic bacteria.³³ Cariogenic bacteria synthesize water-soluble and water-insoluble glucans using glucosyltransferase (GTase). Highly branched glucans are responsible for bacterial cell adherence to the tooth surface.⁽³⁴⁾ EpiCatechin-3-gallate (ECg), GalloCatechin-gallate (GCg) and EpiGalloCatechin-3-gallate (EGCg) strongly inhibit GTase and inhibit adherence of the bacteria to dental surfaces. *Streptococcus mutans* is the strain of bacteria primarily responsible for causing cavities. It clings to teeth and uses the sugars in mouth to produce a sticky, water-

insoluble substance called plaque that coats the teeth. *Streptococcus mutans* and other bacteria then hang on to the plaque and convert sugar to lactic acid, which eats away tooth enamel. The combination of plaque and acid causes cavities. Green tea catechins help fight dental cavities in these ways:

- 1) A direct bactericidal effect against *Streptococcus mutans* and *Streptococcus sobrinus* ;
- 2) Prevention of bacterial adherence to teeth; inhibition of glucosyl transferase (GTase), thus limiting the biosynthesis of sticky glucan ; and
- 3) Inhibition of human and bacterial amylases.³⁵

Studies have shown these effects can occur with as little as one cup of green tea. No wonder that the Japanese people have long held that drinking green tea makes the mouth clean. Green tea extract applied topically inhibits *Streptococcus mutans* bacteria.³⁶ In a Chinese study, green tea extract was used to rinse and brush the teeth. This study's result indicated that *Streptococcus mutans* could be inhibited completely after contact with green tea extract for five minutes. There was no drug resistance after repeated cultures. The scientists hence concluded that green tea extract is effective in preventing dental caries. In humans, a double-blind study showed that rinsing the mouth after meals with 0.05 to 0.5% green tea polyphenols for 3 days inhibits dental plaque formation by 30 to 43%. The effectiveness of green tea catechins against dental caries also has been observed in other countries.³⁷

Inhibition of Plaque Formation

The inhibition of the plaque-forming enzyme glucosyl transferase (GTF) by tea polyphenols was investigated in vitro.³¹ The enzyme GTF, sucrose, and tea polyphenols were mixed and incubated at 37°C for an hour. The sucrose carbon was labeled so that the fate of sucrose could be traced. Without tea poly-phenols, the enzyme catalyzes the formation of insoluble glucan, i.e., plaque.

In the solutions containing tea polyphenols a dose-dependent inhibition of insoluble glucan formation was noticeable. EGCg (and its isomer, GCg) and all theaflavins inhibited the glucan formation almost completely at the concentration of 10 mM. At 1 mM, about the drinking concentration of tea polyphenols, more than 50% inhibition was observed (Table-III).

Table-III

Effect of Tea Polyphenols on the Insoluble-Glucan Formations Catalyzed by GTF (glucosyl transferase)

Sample	Concentration (mM)	% incorporation of (¹⁴ C) glucose* insoluble glucan
(-)Catechin	1.0	77.7 ± 5.9 ^b
	10.0	38.3 ± 3.0
(-)Epicatechin	1.0	94.5 ± 3.5
	10.0	57.7 ± 5.0
(-)Epicatechin gallate	1.0	64.5 ± 6.2
	10.0	17.0 ± 3.2
(-)Gallocatechin gallate	1.0	52.8 ± 2.6
	10.0	4.6 ± 0.1
(-)Epigallocatechin gallate	1.0	58.4 ± 3.3
	10.0	25.0 ± 1.9
(-)Free theaflavin	1.0	43.2 ± 1.4
	10.0	1.7 ± 0.2
Theaflavin monogallate A	1.0	35.5 ± 1.6
	10.0	2.7 ± 0.6
Theaflavin monogallate B	1.0	52.9 ± 7.1
	10.0	2.2 ± 0.4
Theaflavin digallate	1.0	44.1 ± 2.6
	10.0	1.8 ± 0.3

a. Incorporation ratios into insoluble-glucans relative to the respective control are expressed as follows:
 $\% \text{incorporation} = \frac{\text{test}(^{14}\text{C-incorporation})}{\text{control}(^{14}\text{C-incorporation})} \times 100$

b. Mean + S.E. (n=4)

So, the influence of tea beverages on the formation of plaque by *Streptococcus mutans* was observed. Tea leaves were drawn to make a tea extract of normal concentration (2g/200 ml hot water) containing about 1,000 ppm of

polyphenol concentration and in thereafter diluted. Sucrose at 1% concentration was dissolved in the normal and the diluted brews. After adding drops of bacterial solution to the test beverage, a cover glass was immersed in the solution and incubated at 37°C for 3 days. The bacterial plaque formed on the surface of the cover glass was observed. All tea beverages (black tea, oolong tea, green tea, and puer tea) at normal concentrations and up to 4 times dilution were found to inhibit plaque formation (Figure 9).

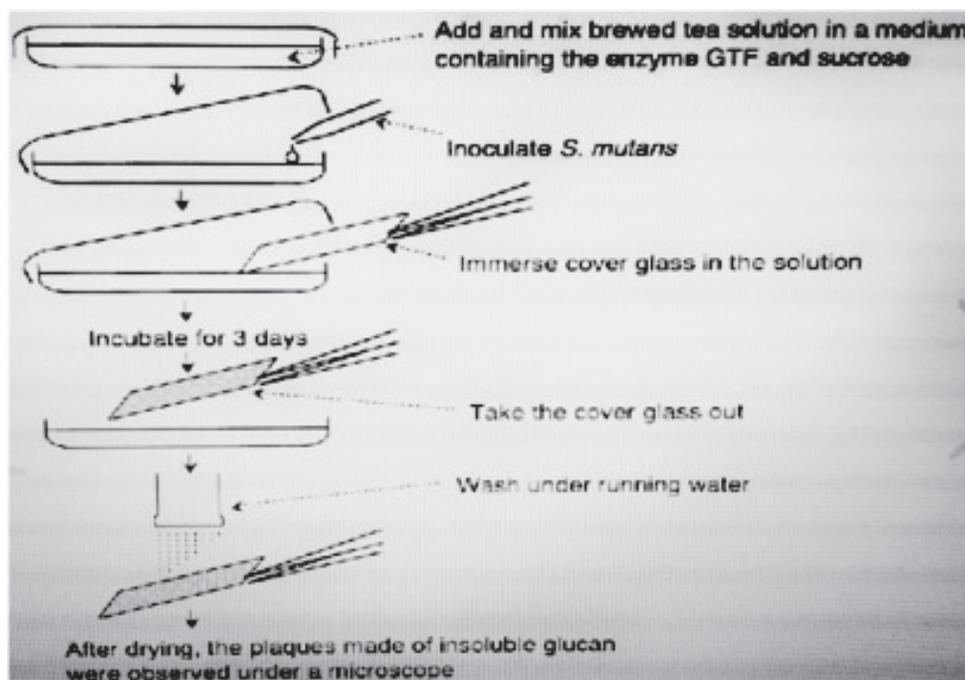


Fig.-9: Method for microscopic observation of dental plaques (insoluble glucan). GTF, Glucosyl transferase

Inhibition of the proliferation of *Streptococcus mutans*:

It was also confirmed that the inhibitory potency of various tea beverages extracted at normal drinking concentrations on the growth of *Streptococcus mutans*. The results in Figure 10 and Figure 11 show that green tea is most effective in suppressing the growth of the bacteria.³⁸

Effects of Green Tea on Oral & Periodontal Health

Gingivitis & Periodontitis

Gingivitis and periodontitis are major forms of inflammatory diseases of the mouth. In gingivitis, the gums become red and swollen. They can bleed easily. Gingivitis is a mild form of gum disease. It can usually

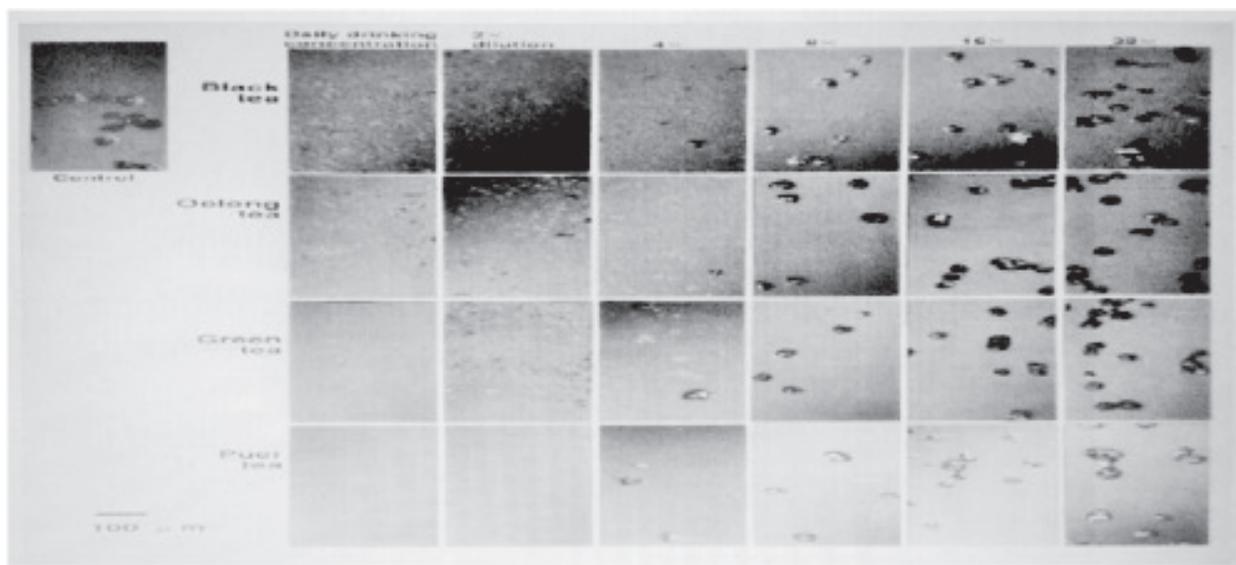


Fig.-10: Anti-dental plaque effect of tea beverages.

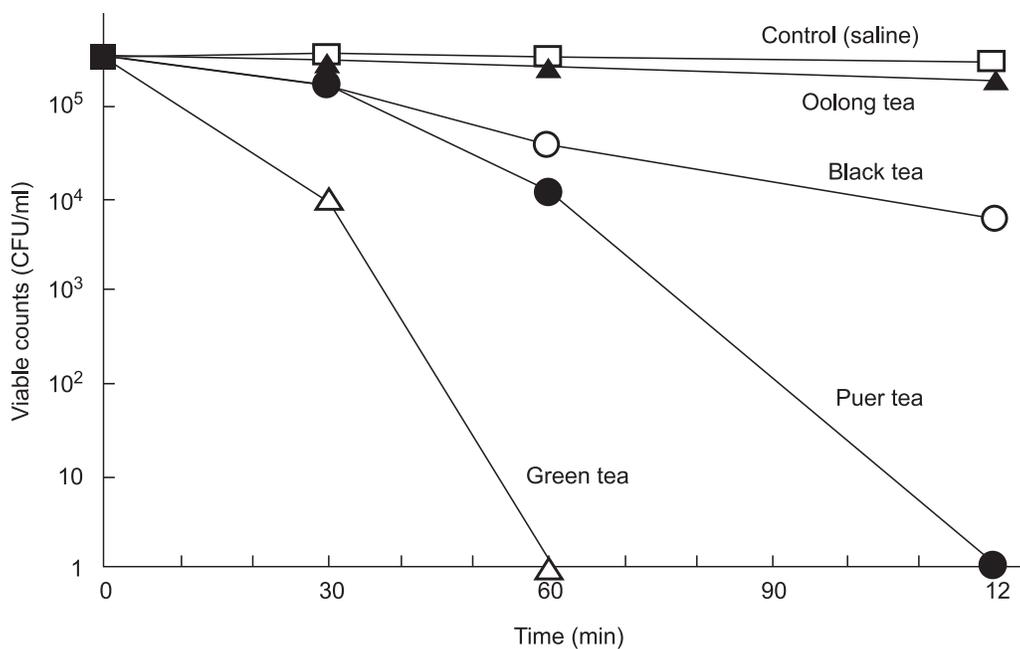


Fig.-11: Antibacterial effect of tea beverages against cariogenic bacterium *Streptococcus mutans*

be reversed with daily brushing and flossing and regular cleanings by a dentist or dental hygienist. Untreated gingivitis can lead to periodontitis. In periodontitis, the gums pull away from the teeth and form pockets that become infected. If not treated, the bones, gums and connective tissue that support the teeth are destroyed. Symptoms of gum disease include: Bad breath that won't go easily, red or swollen gums, tender or bleeding gums, painful chewing, loose teeth, sensitive teeth and receding gums or longer appearing teeth. Their primary etiology is bacteria, which can initiate destruction of the gingival tissues and periodontal attachment apparatus.³⁹ Reduction of the periodontopathic bacteria by scaling and supragingival plaque control can lead to an improvement of the periodontal status.⁴⁰⁻⁴² Complete removal of plaque and calculus is more difficult in deep than in shallow pockets. Hence, the failure of periodontal treatment may be the result of bacterial plaque and calculus remaining after scaling.⁴³ Therefore the use of drugs to treat periodontal diseases is advocated. Green tea has been reported to be useful for prevention of periodontal disease and maintenance of oral health.⁴⁴

A number of reviews addressed the local application of antimicrobial agents to the subgingival area for the treatment of periodontitis.⁴⁵ Green tea has been reported to be useful for prevention of periodontal disease and maintenance of oral health. An epidemiologic study showed that there is an inverse association between the daily intake of green tea and periodontal disease and suggested that drinking green tea at meals and breaks is a relatively easy habit to maintain a healthy periodontium.⁴⁶ Several in vitro studies have suggested that green tea catechins such as EGCg (EpiGalloCatechin-3-gallate) inhibit the growth of *Porphyromonas gingivalis*, *Prevotella intermedia* and *Prevotella nigrescens* and the adherence of *Porphyromonas gingivalis* onto human buccal epithelial cells.⁴⁷ In a clinical pilot study, hydroxypropyl cellulose strips containing green tea catechins as a slow-release local delivery system were applied to the pockets in periodontal patients once a week for eight weeks. The green tea catechins inhibited the bacteria *Porphyromonas gingivalis* and *Prevotella spp.* and a reduction in pocket depth was observed.⁴⁸ These bacteria have been strongly implicated in destruction of periodontal tissues and their reduction can lead to the

improvement of periodontitis. Green tea extract can inhibit the collagenase activity of oral bacteria.⁴⁹ EGCg completely inhibits the growth of three strains of *P. gingivalis* at a concentration of 250 or 500 ig/ml and that of *P. melaninogenicus* at MICs of 2000 ig/ml.⁴⁷ EGCg and ECg inhibit the production of toxic end metabolites of *P. gingivalis*.⁴⁴ EGCg inhibits protein tyrosine phosphatase activity in *P. intermedia*.⁵⁰ It also possesses bactericidal activity against a variety of microorganisms like *Helicobacter pylori*.⁵⁰ An epidemiologic study showed that there is an inverse association between the daily intake of green tea and periodontal disease and suggested that drinking green tea at meals is a relatively easy habit to maintain a healthy periodontium.⁴⁴ According to a study which was performed on 47 subjects for four weeks to investigate the effect of green tea catechins and polyphenols on inflamed gingiva, the treatment group showed a distinct improvement in both plaque index and sulcular bleeding index values, the placebo group showed deterioration in values. The results indicated that the oral application of green tea catechins and polyphenols might have a positive influence on the inflammatory reaction of periodontal structures.³⁶

Halitosis (Bad Breath)

The main constituents of bad breath are volatile sulfide compounds especially hydrogen sulfide (H_2S), methyl mercaptan (CH_3SH) and dimethyl sulfide [$(CH_3)_2S$]. These compounds are the result of proteolytic degradation of various sulfur-containing substrates in food debris, saliva, blood and epithelial cells by predominantly anaerobic gram negative oral bacteria.⁵¹ Antimicrobial polyphenoles in green tea can improve bad breath by suppressing these bacteria.⁵² Deodorant activity decreased in the following order: EGCg > EGC > ECg > EC. The deodorizing effect of EGCG involves a chemical reaction between EGCG and MSH. The reaction involves introduction of a methylthio and/or a methylsulfinyl group into the B ring of EGCG. During this reaction, a methylthio group is added to the orthoquinone form of the catechin generated by oxidation with atmospheric oxygen and helps in reducing halitosis.⁵³ According to a research, mouth washing with a dilute catechin solution for four weeks reduced halitosis associated with periodontal disease.⁵⁰ Chewing gum containing tea catechins significantly decreased MSH

production from saliva containing L-methionine and apparently was useful in reducing bad breath.⁵³

Green tea extract as mouthwash

Moghbel et al. (2010) prepared a mouthwash from green tea extract and compared its antibacterial effects with chlorhexidine gluconate rinse on the mouth aerobic bacterial load. They concluded that the green tea mouthwash reported no evidence of irritation or burn, showed similar antibacterial effects as compared to chlorhexidine and was more safe and economical.⁵⁴ Maroofian (2011) prepared a herbal mouthwash from the dried green tea leaves grown in the northern part of Iran. Ebrahimi et al. (2011) in a clinical trial evaluated the effects of this mouthwash on patients with generalized marginal gingivitis and showed that the mouthwash could improve gingival status of patients suffering from gingivitis.⁽⁴⁴⁾ Previously studies by Tsuchiya H et al 1997 had shown that the plaque index and gingival index decreased significantly after green tea extract was used.⁵⁵

Conclusion:

Humans have many ways of keeping teeth looking bright and healthy. Brushing and flossing is common, along with more extreme methods of teeth whitening and bleaching. However, drinking tea is another method that could be employed by humans to prevent teeth decay. Studies have shown that countries in which tea drinking is widespread, such as India, Japan, and China, there is a lower incidence of dental problems. It can be concluded that there is strong evidence on caries prevention of tea and its components. Additional research is needed to determine the exact methods employed by green and black tea extracts to break down and inhibit the activity of *Streptococcus mutans*, *Streptococcus sobrinus*, etc. Since prevention is always better than cure, more research should be conducted to find the exact caries inhibitory mechanism of tea components, particularly at the cellular level and possible use of these components in oral hygiene products like tooth paste and mouth wash or chewing gum and even in certain dental restorative materials.

References:

1. Parmar Namita, Rawat Mukesh and Kumar J. Vijay; *Camellia Sinensis* (Green Tea): A Review; *Global Journal of Pharmacology* 6 (2): 52-59, 2012.
2. Moghbel A, Hemmati A, Agheli H, Amraee K, Rashidi I. The effect of tragacanth mucilage on the healing of full-thickness

wound in rabbit. *Archives of Iranian Medicine*. 2005;8(4):257-62.

3. David W, Sifton R. *PDR for herbal medicines*. 4th ed: Thomason ; 2004 :408- 14.
4. Rasheed A, Haider M. Antibacterial activity Of *Camellia sinensis* extracts against dental caries. *Archives of Pharmacal Research*. 1998;21(3):348-52.
5. Matsumoto M, Minami T, Sasaki H, Sobue S, Hamada S, Ooshima T. Inhibitory effects of oolong tea extract on caries-inducing properties of Mutans streptococci. *Caries research*. 2000;33(6):441-5.
6. Lang Np, Lindhe J. *Clinical periodontology and ampler dentistry*. 5thed, Iowa (USA) Blackwell; 2008 :183-202.
7. Caranza F, Newman M. *Clinical periodontology*. 10th ed. Philadelphia: WB saunders; 2006: 684-883.
8. Anusavice K J (2001). Caries risk assessment. *Oper. Dent. Suppl*. 6:19-26.
9. Ekstrand KR (2001). Occlusal caries: Pathology, Diagnosis, and Logical management. *Dent. Update* 28:380-387.
10. Mundorff SA, Bibby BG (1990). Cariogenic potential of foods. *Caries Res*. 24:344-349.
11. Clarkson BH (1999). Introduction to Cariology: The Discipline of Cariology; Art or Science. *Dent. Clin. North Am*. 43(4):569-577.
12. Banerjee A, Watson TF, Kidd EAM (2000). Dentin caries: Take it or leave it? *Dent. Update* 27:272-276.
13. Ramya R, Srinivasan R (2007). *Clinical operative dentistry, Principles and practice*, 1st edition. EMMESS Medical Publishers, pp. 53-79.
14. Blasingame J. Green tea prevents bad breath.[cited 2009]. Available from: <http://blog.therabreath.com/2009/08/green-teaprevents-bad-breath>.
15. Mary Lou Heiss; Robert J. Heiss (23 March 2011). *The Story of Tea: A Cultural History and Drinking Guide*. Random House. p. 31. ISBN 978-1-60774-172-5. By the time of the Shang dynasty (1766–1050 BC), tea was being consumed in Yunnan Province for its medicinal properties
16. Martin, p. 29: “beginning in the third century CE, references to tea seem more credible, in particular those dating to the time of Hua Tuo, a highly respected physician and surgeon”
17. Bennett Alan Weinberg; Bonnie K. Bealer (2001). *The World of Caffeine: The Science and Culture of the World’s Most Popular Drug*. Psychology Press. p. 63. ISBN 978-0-415-92722-2. The Portuguese traders and the Portuguese Jesuit priests, who like Jesuits of every nation busied themselves with the affairs of caffeine, wrote frequently and favorably to compatriots in Europe about tea.
18. Saberi, Helen. *Tea, a global history*. London. Reaktion books ltd. 2010. Print.

19. Chow p. 19-20 (Czech edition); also Arcimovicova p. 9, Evans p. 2 and others.
20. Lu Ju p. 29-30 (Czech edition).
21. "Saving the Slips Between Cup and Lips". Firstnewsmagazine.com. Retrieved 2015-04-03.
22. Colleen Taylor Sen (2004). Food Culture in India. Greenwood Publishing Group. p. 26 ISBN 978-0-313-32487-1.
23. Nasir, Tasnuba (June 2011). "Tea Productions, Consumptions and Exports: Bangladesh Perspective" (PDF). International Journal of Educational Research 2 (1): 68–73. ISSN 0976-4089. Retrieved 3 April 2015.
24. Vineet Nair, Prasanta Bandyopadhyay, Debabrata Kundu; Green Tea: A Friendly Oral Beverage? ; INTERNATIONAL DENTAL JOURNAL OF STUDENT'S RESEARCH| Oct 2012-Jan 2013| Volume 1| Issue 3.
25. Tariq, M., A. Naveed and K. Barkat Ali, 2010. The morphology, characteristics and medicinal properties of '*Camellia sinensis*' tea. J. Med. Plants Res., 4(19): 2028-33.
26. Cabrera, C., R. Gimenez and M.C. Lopez, 2003. Determination of tea components with antioxidant activity. J. Agric. Food Chem., 51(15): 4427-35.
27. Shazia Mushtaq; ANTI CARIOGENIC EFFECTS OF GREEN TEA; J.Bio.Innov3 (1), pp: 20-34, 2014.
28. Wang H, et al (2001) Determination of flavonols in green and black tea leaves and green tea infusions by high performance liquid chromatography. Food Research International 34; 2-3: 223-227
29. Astill C, et al (2001) Factors affecting the caffeine and polyphenol contents of black and green tea infusions. J Agric Food Chem 49 (11): 5340-7
30. Harold N, Graham PD (1992). Green tea composition, consumption and polyphenol chemistry. Prev Med 21: 334-50
31. Okada, Mitsugi, Soda, Yoshiko, Hayashi, Fumiko, Doi, Takako, Suzuki, Junji, Miura, Kazuo, Kozai, Katsuyuki per detection of *S. mutans* and *S. sobrinus* in dental plaque samples from Japanese preschool children. J Med Microbiol 51: 443-447, 2002
32. Winstead, Edward R. "Bacterium that causes tooth decay, *S. mutans*, is sequenced." Genome News Network. 10.25.2002
33. Sakanaka S, Shimura N, Aizawa M, Kim M, Yamamoto T. Preventive effect of green tea polyphenols against dental caries in conventional rats. Biosci Biotechnol Biochem (1992); 56: 592-594.
34. Hamada S, Slade HD. Biology, immunology, and cariogenicity of *Streptococcus mutans*. Microbiol. Rev. (1980); 44: 331-384.
35. Hamilton-Miller JM (2001). Anti-cariogenic properties of tea (*Camellia sinensis*). J. Med. Microbiol. 50:299–302.
36. Krahwinkel T, Willershausen B. The Effect of Sugar-Free Green Tea Chew Candies on the Degree of Inflammation of the Gingiva. European Journal of Medical Research 2000; 5: 463-467.
37. Sakanaka, S., 1997. Green tea polyphenols for prevention of dental caries. In "Chemical Applications of Green Tea" (T. Yamamoto, L.R. Juneja, D.C. Chu and M. Kim, Eds.), CRC Press, Boca Raton, FL, pp: 87-101.
38. M Hattori, IT Kusumoto, T Namba, T Ishigami, Y Hara. Effect of tea polyphenols on glucan synthesis by glucosyl transferase from *Streptococcus mutans*. Chem Pharm Bull 38:717–720, 1990.
39. American Academy of Periodontology (1999). The pathogenesis of periodontal diseases (position paper). J. Periodontol., 70: 457-470.
40. Slots J, Mashimo P, Levine MJ, Genco RJ (1979). Periodontal therapy in humans. I. Microbiological and clinical effects of a single course of periodontal scaling and root planing, and of adjunctive tetracycline therapy. J. Periodontol., 50: 495-509.
41. Magnusson I, Lindhe J, Yoneyama T, Liljenberg B (1984). Recolonization of a subgingival microbiota following scaling in deep pockets. J. Clin. Periodontol., 11: 193-207.
42. Hinrichs JE, Wolff LF, Pihlstrom BL, Schaffer EM, Liljemark WF, Bandt CL (1985). Effects of scaling and root planing on subgingival microbial proportions standardized in terms of their naturally occurring distribution. J. Periodontol., 56: 187-194.
43. Rabbani GM, Ash MM, Caffesse RG (1981). The effectiveness of subgingival scaling and root planing in calculus removal. J. Periodontol., 52: 119-123.
44. Hamidreza Arab, Ahmad Maroofian, Shayan Golestani, Hooman shafae, Keyvan Sohrabi and Ali Forouzanfar; Review of The therapeutic effects of *Camellia sinensis* (green tea) on oral and periodontal health ; Journal of Medicinal Plants Research Vol. 5(23), pp. 5465-5469, 23 October, 2011.
45. Needleman IG (1991). Controlled drug release in periodontics: A review of new therapies. Br. Dent. J., 170: 405-408.
46. Kushiya M, Yoshihiro S, Masatoshi M, Yoshihisa Y (2009). Relationship between intake of green tea and periodontal disease. J. Periodontol., 80(3): 372-377.
47. Sakanaka S, Aizawa M, Kim M, Yamamoto T. Inhibitory effects of green tea polyphenols on growth and cellular adherence of an oral bacterium, *Porphyromonas gingivalis*. Biosci Biotechnol Biochem 1996; 60: 745-749.
48. Masatomo Hirasawa, Kazuko Takada, Masaharu Makimura, Shigeo Otake. Improvement of periodontal status by green tea catechin using a local delivery system: A clinical pilot study. J Periodont Res 2002;37:433-438.

49. Makimura M, Hirasawa M, Kobayashi K. Inhibitory effect of tea catechins on collagenase activity. *J Periodontol* 1993; 64: 630-636.
50. Babu Venkateswara, K. Sirisha, and Vijay K. Chava. Green tea extract for periodontal health. *J Indian Soc. Periodontol.* 2011; 15(1): 18-22.
51. Tonzetich J (1977). Production and origin of oral malodor: A review of mechanisms and methods of analysis. *J. Periodontol.*, 48(1): 13-20.
52. Liao S, Kao YH, Hiipakka RA (2001). Green tea: biochemical and biological basis for health benefits. *Vitam. Horm.*, 62: 1-94.
53. Yasuda H, Arakawa T (1995). Deodorizing mechanism of (-) - epigallocatechin gallate against methyl mercaptan. *Biosci. Biotechnol. Biochem.*, 59: 1232-1236.
54. Moghbel AH, Farajzadeh A, Aghel N, Raisi N. Formulation and evaluation of green tea antibacterial mouthwash. Effect on the aerobic mouth bacterial load. *Sci Med J* 2010; 9: 317-330.
55. Tsuchiya H, Sato M. Simultaneous determination of catechins in human saliva by high-performance liquid chromatography. *J Chromatogr B Biomed Sci Appl.* 1997; 703(1-2):253-258.



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