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Published by : Professor (Dr.) Shahiqul Jabbar
Professor & Head
Department of Orthodontics and Dentofacial Orthopedics
Chattagram International Dental College
206/1, Haji Chand Meah Road, Shamserpara, Chandgaon
Chattogram, Bangladesh.
Cell : 01753 20 03 23, Phone : (031) 2573119-23
E-mail : shahique_ jpni@yahoo.com, www.cidch.edu.bd

Printed by : New Computer Suporna
Chattogram
Cell : 01819 80 30 50
Email : abedulhuq1960@gmail.com
supornacomputer@yahoo.com

Chattagram International Dental College
206/1, Haji Chand Meah Road, Shamserpara, Chandgaon, Chattogram, Bangladesh.
Cell : 01753200323, Phone : (031) 2573119-23, E-mail : info.cidchbd@gmail.com
Website : www.cidch.edu.bd

Information to Authors

Chattagram International Dental College (CIDC) started its historical and memorable journey in the 2003 year. CIDC is the only Private Dental College in Chattogram which is smoothly running under the guidance of Chattogram University.

CIDC is approved by the Government of the Peoples Republic of Bangladesh and is recognised by the Bangladesh Medical and Dental Council (BMDC). CIDC is representing pioneer and exemplary academic and clinical oriented research institute of Bangladesh. About 65 Dental students completed their graduation from CIDC per annum.

Chattagram International Dental College commenced to publish a peer reviewed Journal from 1st January 2018 which is recognized by BMDC and having International Standard Serial Number (ISSN) 2707-2185. The journal intend to publish article of authors from any part of the globe, but has a special interest in publishing research articles of authors from Bangladesh and of relevance to developing countries. It interested in Editorial, Original (Research) articles, Special articles, Review articles, Short Communications, Case report and letters on new findings of Medical Science.

Chattagram International Dental College Journal is published in english, biannually eg. January and July with prior approval of Editorial board.

Appropriate measures has been taken to make the journal indexed / abstracted in major international indexing systems including the PubMed/MEDLINE, Index Medicus, Google Scholar, DOAJ, Hinari and Scopus etc.

Submission of Manuscript

Manuscript (Papers) are submitted to the Editor-In-Chief or authorised persons at any time. Papers accepted for publication are subjected to peer review and editorial revision. With full title (Title should be concise and informative) two copies of papers (Along with CD) accompanied by a covering letter signed by Principal and Co-authors including name, academic degrees, designation, the departmental and institutional affiliation. Complete address, Cell number including Email address of Corresponding author should be mentioned. Not more than 7 (Seven) authors will be accepted for all manuscripts.

Manuscript should be typed in English (Font size and style : 10, Times New Roman) on one side of white bond paper of A4 size with margins of at least 2.5 cm, using double space throughout.

Manuscript may be additionally submitted by email also. Email : shahique_ jpni@yahoo.com Ms word 2003/2007). Rejected manuscript will not be returned.

Abstract

A structured abstract should not be of more than 250 words. It should be a factual description of the study performed organized with the heading of Background (Includes aim or objectives) Methods (Includes patient population, procedures and data analysis) Result and Conclusion. The abstract should contain the data to support the key findings or conclusions of the study and this should be self explanatory without references to the text. the first time an abbreviated term is used it should be spelled out in full form and follow with the abbreviation in parentheses for example :- CKD (Chronic Kidney Disease). Please do not cite any references in the abstract.

3 (Three) to 10 (Ten) key words may be provided below the abstract using terms from the medical subject heading (Index Medicus, NLM, USA).

Types of Manuscripts

Editorial : Its a invited article. Based on current affairs of Medical Science with any disciplines. Maxium length of the editorial may be with in 1200-1500 words and number of references maxium in 10 (Ten).

Original Article : A research, observational and experimental article should be devided into the following sections with headings :

- Introduction
- Materials and methods
- Result
- Discussion
- Limitation
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- Acknowledgements
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Single digit numbers used in the text should be in words except datas and reference numbers. Maximum length of text may be with in 3500-4500 words (Excluding abstract, table, figure and references). The total number of reference should not be less than 15 (Fifteen) for the original article.

Special Article / Short Communication

Its a medical based text of any disciplines. Maximum length of the Special article / Short Communication may be with in 2500-3000 words (Excluding abstract, table, figure and references). The total number of reference should not be less than 10 (Ten).

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Its a prestigious article, which is divided into the following sections with headings

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Review article should not generally exceed 8500 words, including illustrations and the number of references should not be more than 30 (Thirty). According to guidelines of BMDC, Review article should be written by senior author, who have written a minimum of 02 Original research articles and 04 Case reports on the same topic.

Case Report

Text of Case report with the following section

- Introduction
- Case Report
- Images (If any)
- Discussion
- Figure / Legends (If any)
- Conclusion
- Disclosure

Maximum length of the text may be with in 2000-2500 words (Excluding abstract and references). The total number of reference should not be less than 10 (Ten).

Letter

Letter should be brief and to the point with in 500-600 words only.

It is noted that standard abbreviations should be used whenever. The full form for which the abbreviations stands followed by the abbreviation in parenthesis should preceede the use of the abbreviation in the text except for standard ones like 45^{O}c, 35mg/L etc in all types of text.

References

Regarding references please follow the Vancouver style (Uniform requirements for manuscripts submitted to biomedical journals prepared by the International Committee of Medical Journal Editors (ICMJE guideline http://www.icmje.org).

Reference citations in the text should be numbered in arabic numerals at the end of the sentence eg [1,2] consecutively in order in which they are mentioned in the text.

Book references should have the name of the authors, chapter title, editors, Book name, the edition, place of publication, the publisher, the year and the relevant pages.

Journal references should have the name of the authors, title of the article, editors, name of the journal volume and issue number, place of publication, the publisher, the year and relevant pages.

The first six authors of a work should be named, followed by 'et al' if there are more than six. If less than six authors the name of the all authors may be mentioned.-

Examples

Book reference : Stoll BJ, Shane AL. Infections of the neonatal infants in RM Kliegman, BF Stanton, JWS Geme, NF Schor. Nelson text book of pediatrics. 20th edn. Elsevier. Philadelphia. 2016;1:909-925.

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Table

- All tables should be numbered using Roman numerals (I, II).
- Table should always be cited in text in consecutively using Roman numericals (eg Table I, II).
- Mentioned the caption at the top of table. Table should be planned as brief as possible.
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Figures / Graphs

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Unmounted glossy print, B-2 size with good contrast (600 pixels). 3 Images / Photographys / Legends are allowed for whole text.

Declaration

The article should accompany a declaration signed by author and co-authors which includes a statement that neither the article nor any part of its essential subtance table or figures is published in any journal nor submitted elsewhere for consideration of publication before appearing in this journal. The declaration form must be collected from the office of Editor-In-Chief

Department of Orthodontics and Dentofacial Orthopedics
Chattagram International Dental College
206/1, Haji Chand Meah Road, Shamserpara,
Chandgaon, Chattogram, Bangladesh.
Cell : 01753200323, Phone : (031) 2573119-23
E-mail : shahique_ jpni@yahoo.com
Website : www.cidch.edu.bd

Competing Interests

Chattagram International Dental College Journal requires authors to declare any competing financial or other interest in relation to their work. Where an author gives no competing interests, the listing will read the author (s) declare that they have no competing interests.

Editorial

Chattagram International Dental College Journal

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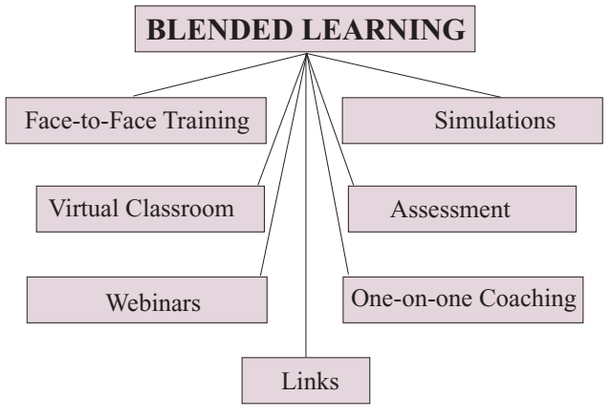
Blended Learning : A New Horizon in Medical Science of Bangladesh

Md Akbar Husain Bhuiyan[1*]

What is Blended Learning?

Blended Learning is a style of education in which students learn via electronic and online media as well as traditional face-to-tace teaching. On the other hand according to Wikipedia-Blended learning also known as hybrid learning is an approach to education that combines online education materials and opportunities.

For interaction online with traditional place-based classroom methods.



Blended Learning is one of the most used methods in education to promote active learning and enhance students' learning outcomes. Although Blended learning has existed for over a decade, there are still several challenges associated with it. For instance the teacher's and student's individual deffernces, such as their behaviors and attitudes, might impact their adoption of Blended learning. These challenges are further exacerbated by the COVID-19 pandemic, as school and Universities had to combine both online and offline courses to keep up with health regulations.

Purpose of Blended Learning :-

i) Blended Learning empowers both teachers and students to improve learning outcomes.

1. Professor of Pediatric Surgery (Retired)
Chittagong Medical College, Chattogram.

*Correspondence to :
Professor (Dr.) Md Akbar Husain Bhuiyan
Cell: 01819 64 01 23
Email : akbarbeverly@yahoo.com

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ii) Blended learning allows teachers to spend less time giving whole-class lessons and more time meeting with students individually or in small groups

iii) Blended learning allows institute to teach more students more efficiently at a lower cost.

Adventages of Blended Learning :-

- Improves ability to personalize learning.
- Potential for individual progress.
- Keeps learners engaged with use of variety of content type.
- Instructor has the ability to assess learning trends and act accordingly.

Disadvantages of Blended Learning :-

- Access to resources-A blended learning model often requires students to utilize technology outside of the classroom.
- Supporting individual learners-There is no catch-all spproach to education.
- A lack of direct contact.
- Abuse/inappropriate use of blended learning.

Challenges of Implementing Blended Learning in Medical Education

Each type of education has three domains such as knowledge, skill and attitude. Knowledge can be taught smoothly in blended learning more than skill & attitude. Even in assessment of students' knowledge domain can be assessed in larger scale smoothly in blended way than those of skills and attitude.

Blended Learning : A New Horizon in Bangladesh

On July 1, 2021, the ministry of Education organized its first virtual meeting to propose and discuss work that needs to happen to establish a blended education ecosystem in Bangladesh.

On 17 August, 2021, under the leadership of the Ministry of Education, the conception of a Blended Education Master plan was introduced during a virtual meeting and an interministerial blended education National Taskforce was formed which consisted of the Ministry of Education, the Ministry of Primary and Mass Education, Health & Family Welfare Division of Ministry of Health & Family Welfare, the Ministry of Post and Telecommunication, the ministry of planning and the information and communications technology division. This also included the formation of following seven sub committees-

i) Pre-primary, Primary and non-formal education.

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ii) Secondary education.
iii) Higher Education.
iv) Madrash Education.
v) Technical Education.
vi) Medical Education.
vii) Research & Development.

The sub-committees were provided Terms of Reference (TOR) and associated guidelines, so that they can go about planning for the master plan, based on their particular sector. Each of the first six sub-committees were also divided into five working groups, based on the key elements.

Honorable Secretary, Health Education and Family Welfare Division, Ministry of Health & Family Welfare is the Chairperson & director General, Directorate General of Medical Education (DGME) is the member secretary of medical education subcommittee with other concerned members.

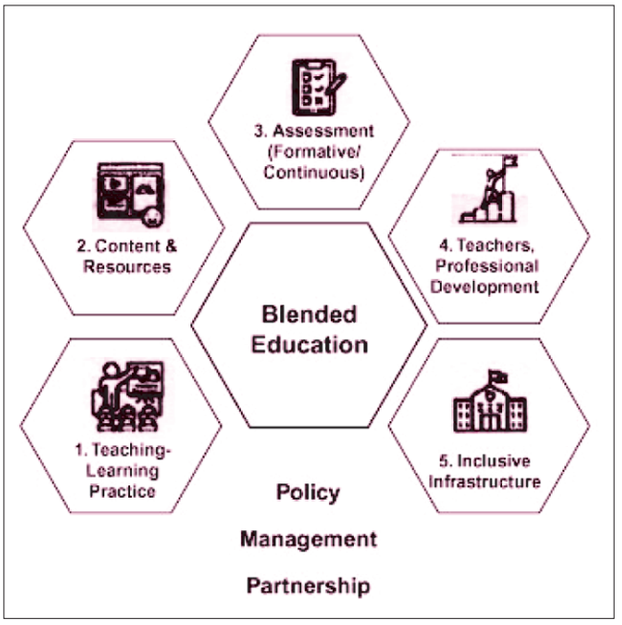
A meeting of Medical Education Sub-committee on blended learning was held at the ministry presided by honorable Secretary, Health Education and Family Welfare Division. Ministry of Health & Family Welfare.

On the basis of the recommendation of the above meeting a Technical Committee on blended learning to work for medical education sub-committee was formed with Director, CME as Chairperson and Professor, curriculum development and evaluation, as member secretary with other concerned members approved by the ministry.

Medical education subcommittee & technical committee members participated in the different online & offline meetings & workshop of National Task Force. As per the guidelines of those meetings and workshops a plan for medical education was developed and submitted tools National Taskforce as a part of the master plan on blended learning which was submitted to Honorable Prime Minister, Government of the People's Republic of Bangladesh.

To formulate the plan on blended education the following five key elements are addressed.

i) Teaching-Learning Practices, which aim to prepare learners for the future with 21" century problem solving skills through synchronous and asynchronous interaction.
ii) Education Content and Resources, which are accessible, affordable, reusable, interactive and personalized educational content and resources for all.
iii) Assessment, continuous/formative and summative among which formative assessments are real-time and performaces-based through the use of artificaial intelligence tools.
iv) Teacher Professional Development, which is blended, personalized and continuous.
v) Inclusive infrastructure, which includes ensuring open, accessible and inclusive physical and virtual learning spaces for all, including systems for connectivity, electricity, bandwidth and devices such that learners and teachers have access to these learning spaces.



In Additional Three Enabling Factors are Associated with these Key Elements :-

i) Policy, which should be comprehensive and practitioner driven. This includes this master plan as well.
ii) Management, which include real-time and data-driver progress tracking and guidance.
iii) Partnerships, which include public-private-people partnership, as no one entity will be able to execute this master plan alone.

Technical committee in consultation with Medical Education sub committee on blended learning formed the following five working groups-

i) Undergraduate medical education (MBBS).
ii) Undergraduate Dental Education (BDS).
iii) Alternative medicine education.
iv) Nursing and midwifery education.
v) Allied health professionals (IHT & MATS) education.

For postgraduate education concerned universities, bodies & authorities will take the essential steps.

Under the guidance of the medical education subcommittee with the supervision and collaboration of Technical working group each of the five working group developed their plans on blended learning for the year 2023, 2027, 2030 with the vision of 2041.

Issuses for Blended Learning in Medical Eduction in Bangladesh :-

Identification of contents for teaching & assessment with appropriate time allocation.

Developing and making available of resource materials for blended learing.

Orientation of teachers & students on blended learning.

Institutional set up, connectivity & readiness for blended learning-at central & peripheral level.

Financial & logistic support for blended learning.

Endorsement, governance & monitoring through concerned regulatory bodies.

For effective Blended learning a generalizable policy framework should be made by the educationists and researchers. The government should ensure 4G/5G network facilities in the nuke and corner of this country and also ensure some loans/subsidy to the students for buying necessary devices for their learning. Proper training for the students and teachers can ensure more effective online classes and if we think to abouned blended classes et will be also helpful for both the teachers and the students towards a better teaching learning environment. There is 'Center for Teaching and Learning' in every medical college here in Bangladesh, training of teachers and students in regular intervals could make Blended learning more effective and sustainable.

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Original Article

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Periodontitis among the Pregnant Women Attending at a Dental Outpatient Department of Southern Medical College Hospital, Chattogram

Nadia Parveen[1] A A M Shanewaz Khan[2] Sumon Rahman Chowdhury[3*]

Abstract

Background : *Periodontal disease is a common oral infection that is quite prevalent worldwide. Studies have linked it to adverse outcomes among pregnant women. Periodontitis is one of the many causes of preterm labor and low birth weight. The aim of this study is to find the proportion of periodontitis among the pregnant women of Chattogram and identify what risk factors contribute to the development of periodontitis.*

Materials and methods : *A descriptive type of cross-sectional study was conducted among pregnant women attending the Dental Outpatient Department of Southern Medical College Hospital between January 2021 to end of June 2021. A total of 211 pregnant women were interviewed using a pre-tested questionnaire. Then their oral status was evaluated, and periodontal scoring was done using the Community Periodontal Index developed by WHO.*

Results : *The proportion of periodontitis among the surveyed sample was 59.7%. The mean age of the respondents was 24.4±4.27 years and the mean weight was 53.78 ± 5.95 kg. In case of BMI, the mean was 23.6± 3.9 with four respondents being under weight (BMI< 18.5) and thirteen people in the obese range (BMI>30). Proportion of diabetes among the respondents was 20.4%. when asked about how respondents maintained dental hygiene, majority of them used toothbrushes (80%) and toothpaste (47%). However, when it came to inquiring about their oral problems, 57.8% of respondents complained about gum bleeding and 48.8% complained about teeth sensitivity. A significant association was found between severity of periodontitis and chewing of betel leaf (Pan) (p<0.001) and areca nut (Supari) (p=0.002). A significant association was also found between chewing pan (p= 0.011) and supari (p= 0.005) and teeth sensitivity to hot and cold.*

Conclusion : *Oral disease prevention strategies should be incorporated during antenatal care visits to curtail the burden of adverse events of pregnancy. The reduction in the incidence and prevalence of periodontal disease can reduce its associated systemic diseases and can also minimize their financial impact on the health-care systems.*

Key words

Proportion; Pregnancy; Periodontitis.

Introduction

Periodontal Disease is a destructive inflammatory disorder of the hard and soft tissues surrounding teeth[1]. This infectious disease has a worldwide distribution and can affect up to 90% of populations[2,3]. Poor oral hygiene, increasing age, smoking, low educational level, some ethnicities and poor economic status have been reported as risk factors for periodontal disease[1-4].

The infected periodontium can represent an endocrine like source of potentially deleterious cytokines and lipid mediators which may increase the likelihood of adverse pregnancy outcomes. Hence, outcome of pregnancy can be influenced by gingival health. Pregnant women with periodontal disease are more susceptible to poor maternal and perinatal outcome such as preeclampsia, gestational diabetes, preterm labor, fetal growth restriction, low birth weight and perinatal mortality.[5-9]

Periodontal disease is a common oral infection with prevalence ranging from 10-60%[10]. One in four adults in the world suffers from periodontal disease and pregnancy is associated with increased susceptibility[11]. Pregnant women have a higher incidence of periodontitis and gingivitis compared with their non-pregnant counterparts and the prevalence rates vary between 36% and 100%[11]. In a developing country like Bangladesh, disease burden is enormous, and availability of curative treatment is quite inadequate compared to the need. Lack of oral hygiene awareness of people in Bangladesh have virtually made them hostage to the services of non-registered, in formal professionals.

1. MPH Student, Bangladesh Open University
School of Science and Technology, Gazipur.
2. Dental Surgeon
Southern Medical College Hospital, Chattogram.
3. Registrar of Diabetes, Endocrinology and Metabolism
Chittagong Diabetic General Hospital, Chattogram.

*Correspondence to :
Dr. Sumon Rahman Chowdhury
Cell: 01670 39 30 31
Email : sumonrahman79@yahoo.com

Date of Receipt : 05-05-2022
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Materials and methods

This was a descriptive type of cross-sectional study that was conducted at Southern Medical College Hospital during the period from January to June 2021.

Purposive sampling technique was used to collect the study sample. Sample size was 211.

Inclusion criteria

All pregnant women attending at Dental Outpatient Department.

Exclusion criteria

- Pregnant women who were another dental problem.
- Pregnant women who did not give consent for the study.

Prior to collecting data, written permission was obtained from the director of the specified hospital and a written informed consent was obtained from all participants. All collected data was kept in a secured place under lock and key. On data analysis in SPSS version-23.

Results

A total of 211 respondents were included in this study. Prevalence of periodontal disease was 59.7% among the study respondents.

The mean age of the respondents was 24.45±4.28 years with a minimum age of 17 years and a maximum age of 40. In case of weight of study subjects, the mean weight was 53.8±6 kg. The most frequently observed weight was 49 kg and 21 respondents had this weight. According to BMI of the respondents, the average BMI was 23.6±3.9. The minimum BMI calculated was 14.6 and the maximum was 37.8. Although most of the respondents were within the normal BMI range (n=156), six individuals were underweight (BMI<18.5), thirty-six were overweight (BMI between 25 to <30), and thirteen were obese (BMI >30).

Table I Socio-Demographic characteristics of the respondents (n=211)

Demographic variables		No. of respondents Frequency (%)
Occupation of respondent		
	Housewife	117(55.4%)
	Garments worker	65(30.8%)
	Day laborer	10(4.7%)
	Service holder	2(0.9%)
	Own business	17(8.1%)
Education level		
	Illiterate	31(14.7%)
	Primary school	111(52.6%)
	High school	24(11.4%)
	SSC	30(14.2%)
	HSC	11(5.2%)
	Graduate	4(1.9%)
Family income		
	Less than 10000	91(43.1%)
	10,000 to 20,000	107(50.7%)
	20,000 to 30,000	12(5.7%)
	More than 30,000	1(0.5%)
Number of children		
	None	68(32.2%)
	One	103(48.8%)
	Two	31(14.7%)
	More than 2	9(4.3%)
Trimester of pregnancy		
	First	71(33.6%)
	Second	89(42.2%)
	Third	51(24.2%)
OCP use		
	No	51(24.2%)
	Yes	160(75.8%)

All of the 211 respondents were married. Among them, majority were housewives (n=117) followed by garments workers (n= 65). Most of the respondents had up to primary level of education while only four women completed graduation. Most families had only one child (n=103) and the average family income for most families was between 10,000 to 20,000 taka per month (n=107). Most respondents were in their second trimester of pregnancy. Among all respondents, 43 (20.4%) were diagnosed with diabetes and 160 (75.8%) had a history of using oral contraceptive pills prior to pregnancy (Table I).

They were specifically asked about what they used for cleaning their teeth and if they had any habits of taking betel leaf or smoking.

Table II Dental habits of respondents

Dental habit		No. of respondents Frequency (%)
Clean teeth regularly		
	No	11(5.2%)
	Yes	200(94.8%)
number of times teeth are cleaned daily		
	Once	161(76.3%)
	Twice	46(21.8%)
	Thrice	4(1.9%)
brushing equipment		
	Toothbrush	169(80.1%)
	Miswak	16(7.6%)
	Finger	26(12.3%)
medium used to clean teeth		
	Toothpaste	100(47.4%)
	Tooth powder	82(38.9%)
	Both tooth paste and powder	9(4.3%)
	Coal powder	17(8.1%)
	Others	3(1.3%)
gum/mouth bleeding on brushing		
	No	89(42.2%)
	Yes	122(57.8%)
teeth sensitivity to hot or cold		
	No	108(51.2%)
	Yes	103(48.8%)

Table II illustrates the dental hygiene habits of the respondents. Out of 211 respondents, 200 cleaned their teeth regularly with majority of them (n=161) cleaning once a day. Toothbrushes (n=169) were commonly used with toothpaste (n=100) as the most frequent medium. Yet, more than half the respondents (n=122) overall suffered from gum bleeding on brushing and almost half of them (n=103) had teeth sensitivity to hot and cold.

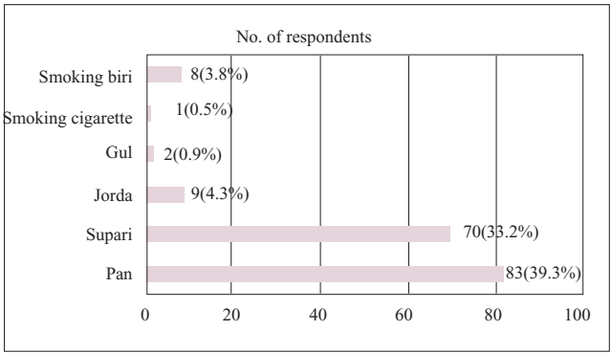

Figure 1 Bad habits among respondents

Among all the respondents, only 97 respondents did not have a habit of ingesting betel leaf or any other associated products. The remaining (n=114) took at least one of the following. Almost half the respondents who take these products (n=70) have been taking it for one year or more, and majority of respondents with this habit (n=96) took it only once a day. Eight respondents had a habit of smoking cigarette and one respondent smoked Biri.

Table III Knowledge of the respondents about oral hygiene

Knowledge on oral hygiene		No. of respondents Frequency (%)
Knowledge on types of oral disease (n=211)		
	No	160(75.8%)
	Yes	51(24.2%)
Types of oral diseases respondents know about (n=51)		
	Carious teeth	36(70.6%)
	Gum bleeding	10(19.6%)
	Inflammation	2(3.9%)
	Ulceration 3(5.9%)	
Extra care of oral hygiene necessary in pregnancy (n=211)		
	No	158(74.9%)
	Yes	53(25.1%)
Bad oral hygiene can harm baby (n=211)		
	No	166(78.7%)
	Yes	45(21.3%)
Dental disease and pregnancy are related (n=211)		
	No	205(97.1%)
	Yes	6(2.8%)
Gum disease is related to preterm labor and LBW (n=211)		
	No	211(100%)

Only a quarter (n=53) of respondents knew that extra care of oral hygiene was necessary in pregnancy. About 21% respondents (n= 45) knew that bad oral hygiene can harm the baby. Only six individuals knew that dental diseases are related to pregnancy and none of the respondents knew that gum diseases are related to preterm labor and low birth weight.

Only fifty-nine patients actually visited a dentist when they experienced dental pain.

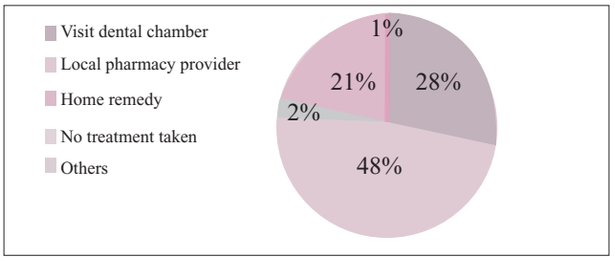

Figure 2 what respondent usually does when they have dental pain

Table IV Respondent's dental visit history

Dental history		No. of respondents Frequency (%)
Ever visited dentist (n=211)		
	No	147(69.7%)
	Yes	64(30.3%)
Reason for visit (n=64)		
	Consultation/advice	15(23.4%)
	Pain in teeth/gum	48(75%)
	Routine check up	1(1.6%)
Cost of visit (n=64)		
	<Tk 500	21(32.8%)
	Tk 500 to 1,000	25(39%)
	>Tk 1,000	18(28.1%)
Was it expensive (n=64)		
	No	41(64%)
	Yes	23(36%)

Most of them (n=48) visited for teeth or gum pain. The cost treatment for most patients was less than 1000 taka. This was not expensive for most of the respondents.

Table V Community periodontal index score of respondents and the subsequent association between periodontal health and pan and supari intake

Periodontal health condition		Frequency	Percent
Score 0	Healthy periodontal conditions	85	40.3
Score 1	Gingival bleeding	6	2.8
Score 2	Calculus and bleeding	6	2.8
Score 3	Shallow periodontal pockets (4 to 5 mm)	40	19.0
Score 4	Deep periodontal pockets (6mm or more)	74	35.1

Thirty-five percent of the respondents had deep periodontal pockets.

Table VI Association between periodontal health and pan and supari intake

Periodontal health condition		Pan Intake (n=83) Frequency (%)	Supari Intake (n=70) Frequency (%)
Score 0	Healthy periodontal conditions	18(21.7%)	16(22.9%)
Score 1	Gingival bleeding	1(1.2%)	1(1.4%)
Score 2	Calculus and bleeding	3(3.6%)	2(2.8%)
Score 3	Shallow periodontal pockets (4 to 5 mm)	19(22.9%)	18(25.7%)
Score 4	Deep periodontal pockets (6mm or more)	42(50.6%)	33(47.1%)
	p value	<0.001	0.002

The table above shows the association between periodontal health condition using the community periodontal index, and the intake of pan and supari. A chi squared test was used and a highly significant association was found where people taking pan or supari were more likely to develop periodontal diseases.

Table VII Association between teeth sensitivity and pan and supari intake

Teeth sensitivity to hot and cold	Pan (n=83) Frequency (%)	Supari (n=70) Frequency (%)
Yes (n=103)	50(48.5%) (60.2%)	44(42.7%) (62.9%)
No (n=107)	33(30.8%) (39.8%)	26(24.3%) (37.1%)
p value	0.011	0.005

The table above displays the relationship between teeth sensitivity and intake of Pan and supari. As observed, a significant association was found between pan intake and teeth sensitivity. A very highly significant association was found between supari intake and teeth sensitivity.

Discussion

In fact, even during prenatal and antenatal visits, no advice regarding oral hygiene is given to patients. However, with the rising focus on improving maternal and neonatal outcome to achieve the targets of sustainable developmental goals, it has become necessary to address all the risk factors associated with adverse outcomes in this population. Periodontal diseases are prevalent worldwide and the association between periodontal-pathogenic bacteria and adverse birth outcomes has been reported in many studies[12-14].

A total of 211 pregnant women were enrolled in this study out of which 126 women had periodontal problems on examination. The proportion of periodontitis among the surveyed sample was 59.7%. This is similar to the data collected globally where the estimation of people suffering from periodontal diseases is between 20-50% irrespective of developed or developing nations[15]. In case of age group, one study by Nazir et al reported that among adolescents, 21.2% had no periodontal diseases while among adults and older persons, 9.3% and 9.7% of the study population had healthy periodontal conditions[16]. Our study showed a higher proportion of adolescents to have healthy periodontal conditions (Almost 50%). Similarly, around 20-25% of adults and elderly people in our study also had healthy gums.

In fact, studies have concluded periodontal diseases to be a risk factor for various adverse pregnancy outcomes, including but not limited to prematurity, low birth weight, fetal growth restriction, pre-eclampsia and even gestational diabetes mellitus[17].

Among the obese population, none were diagnosed with diabetes mellitus. Although a study conducted by Zamboon et al in 2018 showed that periodontal disease and obesity could increase the chance of gestational diabetes mellitus among pregnant women due to various inflammatory and oxidative responses, no such finding was observed in our study.[18]

When questioned about oral hygiene practices, most of the respondents cleaned their teeth at least once daily. Majority of them used toothbrushes and toothpaste. However, when it came to inquiring about their oral problems, 57.8% of respondents complained about gum bleeding and 48.8% complained about teeth sensitivity. This is similar in some aspects with another study conducted at the Mothers and Children Welfare Center in Bangladesh where majority of pregnant respondents used toothbrushes before breakfast for cleaning, yet 87.3% had caries affected teeth and 94.1% had gingivitis.[19] Presence of gingivitis and calculus was higher among the elder age group (20-35 years) in that particular study. This finding was similar to ours where a worse CPI score was observed among the elderly women (p= 0.04). Previous evidence has established that the prevalence and severity of periodontitis increase with age[20]. Some studies have suggested that due to the natural process of aging, there are changes in host immunity against disease processes that leads to loss of periodontal support tissue[21]. Others believed that increasing severity could be due to untreated cumulative effect of the disease process over a period of time[22].

Another factor that could attribute to these problems despite consistency in maintaining oral hygiene is the habit of using pan, supari, etc. The findings in our study show a significant association between CPI scoring and intake of pan (p<0.001) and supari (p=0.002). Similarly, a significant association was also found between the intake of pan (p= 0.011) &supari (p= 0.005) and teeth sensitivity to hot and cold. Lifestyle plays a major role in various disease conditions and periodontitis is one example as such. Chewing of betel quid is common in many countries including Bangladesh, and studies have demonstrated an association between betel quid chewing and periodontal diseases[23].

Although previous studies conducted in other parts of the world found oral contraceptive pills to have an adverse.

effect on periodontal health our study did not find any significant association. One plausible cause is that studies regarding OCP use were conducted on non-pregnant women[24]. Another reason may be attributed to the non-compliance among Bangladeshi women who have accepted to use OCP[25].

Pain is a common cause for dental visits in Bangladesh owing to lower socioeconomic status of patients and inability to afford dental visits until deemed very necessary.[26] Among the respondents who visited for pain, it was unclear, what type of treatment they obtained since one study has shown that most patients cannot afford expensive dental procedures and hence end up receiving temporary treatment for relief of pain or undergo a tooth extraction.[26] As a result, we cannot say for sure if the low expenses of dental visits reported were due to temporary relief of diseased condition or was a permanent solution to their problem.

Limitation

Due to the pandemic situation, the study involved limited sample size. So the result may not coincide with large scale survey.

Conclusion

From this study we found that, the proportion of periodontal diseases among pregnant women was 59.7%. A significant association was found between intake of pan ($p<0.001$) and supari ($p=0.002$) and periodontal diseases. A significant association also found between chewing pan ($p=0.011$) and supari ($p=0.005$) and teeth sensitivity to hot and cold. It is quite obvious that additional work is needed to clarify and confirm the relationship between periodontitis and preterm low birth weight. If intervention opportunities exist that has the potential to decrease the incidence of preterm births that would be better to justify the outcome.

Recommendations

1. Conducting a study involving a larger sample from different districts among the general pregnant population using random sampling may give a more accurate result about the proportion of periodontitis within the pregnant population.

Disclosure

All the authors declared no competing interest.

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Perceived Stress among the Doctors of Bangladesh

Sadia Chowdhury[1*] Marufa Akhter[2] Md. Mahfuzul Haque Sarkar[3] A H M Kamal[4]

Abstract

Background: *Stress is an inevitable part of life that cannot be avoided. Stress is more prevalent among doctors due to the heavy workload. This stress can result in harmful consequences for doctors themselves and the patients. The present studyaimed to assess perceived stress among doctors of different ages working in Bangladesh.*

Materials and methods: *A cross-sectional, survey was conducted in January and February 2022. The Perceived Stress Scale (PSS-10) was used to assess the level of stress. Data collected were analyzed using the Microsoft Excel spreadsheet (Version 2010) and all ethical considerations were followed.*

Results: *One hundred and forty-ninedoctors participated in the study, where 81 were male and 68 were female. Moderate stress was found predominantly in 67.11% of doctors, the low stress in 19.43%,and high stress in 13.42% of doctors. Statistically, a significantly higher stress level was found in the 36-40 years age group (p=.0117) and the doctors dissatisfied with their income (p=.0018).*

Conclusion: Higher age group dissatisfaction with income, play major role in stress of doctors.

Key words

Doctor's; Perceived stress; Stree.

Introduction

Psychological distress like stress and depression has become a significant mental health issue in our working environment that could have the worst possible consequences. These include low productivity, absenteeism and job turnover.[1] The prevalence of stress and stress-related anxiety and depression in medical students, postgraduate trainees and qualified physicians is increasing in number day by day.[2] The complex environment of a modern medical workplace, such as hospitals and medical colleges, makes doctors respond differently, some find it exciting, whereas some feel stressed from the heavy workload.[3] In conclusion, this kind of psychological distress among doctors is harmful to their health and negatively influences their patients negatively.[4] Moderate and high emotional distress increases the likelihood of failure at work.[5] Thus, the topic of stress and mental health of doctors is a concern for both doctors and the health of other people.[6] Lower career satisfaction and lower-income compared to workload are likely associated with high-stress levels in our doctors.[1] In Bangladesh, some studies about mental health target specific doctor groups such as resident doctors. Still, there is little documentation about the overall doctor community's stress level, including doctors working in places like government hospitals, doctors at private hospitals, etc.The present study aims to identify how stressed our doctors are and their associated factors.

1. Assistant Professor of Biochemistry
Army Medical College Jashore.
2. Associate Professor of Biochemistry
Ad-Din Sakina Medical College, Jashore.
3. Assistant Professor of Forensic Medicine
Army Medical College Jashore.
4. Professor of Biochemistry
Army Medical College Jashore.

*Correspondence to :
Dr. Sadia Chowdhury
Cell: 01701 77 52 24
Email : sadiachowdhury714@gmail.com

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Materials and methods

A cross-sectional study was conducted over government hospitals, private hospitals and medical colleges. The sample size was 149. The selection of the sample was made by usinga convenient sampling technique. The study was conducted through a google form circulated through emails and messenger. After taking informed consent, the google form was divided into two sections. The first section carried the socio-demographical factors such as age, sex, marital status, current job, working hours, H/O mental illness, co morbidity, smoking, consumption of alcohol and satisfaction with current monthly income. Perceived Stress Scale-10 (PSS-10) was used to determine the doctors' stress levels based on their perceptions about their life according to their past 1 month experience in the second section. The inclusion criteria were doctors who responded and the exclusion criteria were doctors who did not answer.

Perceived Stress Scale (PSS) developed by Cohen, Kamarck, and Mermelstein, is one of the most widely used tools to measure psychological stress in the world.[7] Data collected were analyzed using the Microsoft Excel spread sheet (Version 2010). Demographic variables were mentioned in terms of percentages. PSS scores were obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0) to the four positively stated items (Items 4, 5, 7, and 8) and then summing across all scale items. Scores ranging from 0-to 13 would be considered low

stress. ● Scores ranging from 14-26 would be considered moderate stress. ● Scores ranging from 27-40 would be considered high perceived stress.The Chi-square test was used to determine the association of stress with different demographic variables.

Results

149 doctors participated in the study. Table I shows all age groups were represented, with most subjects from 36-40 years group 30.87%. More than 45 years were 5.36%, 41-45 years were 4.03%, 31-35 years were 29.53%, and 25-30 years was 30.20%. It also shows males were more predominant (54%) than females (46%) in the case of response. 82% were nonsmokers and only 18% were smokers, 94% did not consume alcohol and 6% consumed alcohol. 58% were dissatisfied with their monthly income and 42% were satisfied. Most of the doctors who responded were in government service (40%), whereas 35% were in private hospitals and 15% were in post-graduation courses. Most of the doctors (52%) had to work for 36-38 hours/week, 25% worked more than 48 hours/week, and 23% worked less than 36 hours/week.

Table I Frequency and percentage of different demographic variables

Variables		No	%
Age in years	25-30	45	30%
	31-35	44	29%
	36-40	46	31%
	41-45	6	4%
	>45	8	6%
sex	Male	81	54%
	Female	68	46%
Satisfied with monthly income	Yes	63	42%
	No	86	58%
Smoking	Yes	27	18%
	No	122	82%
Alcohol consumption	Yes	9	6%
	No	140	94%
Current job	Doctor in govt hospital/medical college	59	40%
	Doctor in private hospital/medical college	52	35%
	Post-graduation course	22	15%
	General practitioner	4	3%
	Temporary job	12	8%
	<36 hours/week	22	23%
Working hours	36-48 hours/week	77	52%
	>48 hours/week	38	25%

Figure 1 showed most doctors had moderate stress levels (67.11%) withlow-stress levels in second (19.43%) followed by high-stress levels (13.42%).

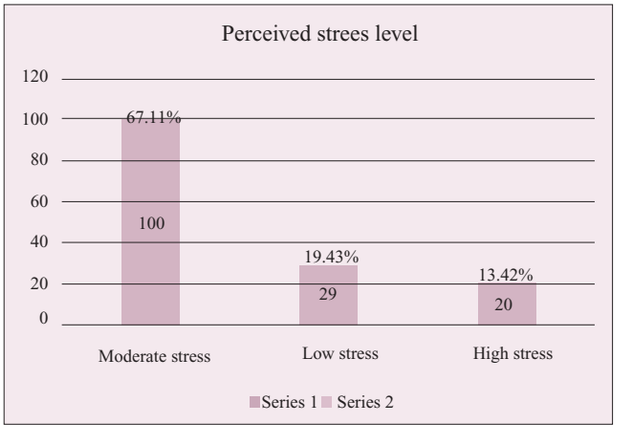

Figure 1 Total percentage of different perceived stress levels of doctors

Table II showed moderate stress was more common in 36-40 years (75.55%) and 41-45 years (71.42%). High stress was more in 41-45 years (14.28%), followed by 31-35 years (13.64%). > 45 years doctors were in low stress mostly (75%). Moderate stress was found in both males (67.90%) and females (66.18%), whereas High stress was markedly found in females (19.12%) compared to males (8.61%). Doctors of private hospitals were primarily under moderate stress (71.15%) followed by 68.18% of postgraduate students.

Table II Percentage of stress in different demographic variables

Variable	Stress					
	Low		Moderate		High	
	No	%	No	%	No	%
Age group (Years)						
25-30	7	15.55%	29	64.44%	9	20%
31-35	8	18.18%	30	68.18%	6	13.64%
36-40	7	15.55%	34	75.55%	4	8.88%
41-45	1	14.28%	5	71.42%	1	14.28%
>45	6	75.00%	1	12.5%	1	12.50%
Sex						
Male	19	23.46%	55	67.90%	7	8.61%
Female	10	14.70%	45	66.18%	13	19.12%
Marital status						
Unmarried	3	10.71%	19	67.85%	6	21.42%
Married	26	21.49%	81	66.94%	14	11.57%
Current job						
Gov. hospital/medical college	15	25.42%	39	66.10%	5	8.47%
Private hospital/medical college	9	17.30%	37	71.15%	6	11.53%
Post-graduation course	3	13.64%	15	68.18%	4	18.18%
General practitioner	1	25%	2	50%	1	25%
Temporary job	1	8.33%	7	58.33%	4	33.33%
Current working hour						
<36 hours/week	5	14.70%	24	70.58%	5	14.70%

Variable			Stress			
	Low		Moderate		High	
	No	%	No	%	No	%
36-48 hours/week	14	18.18%	54	70.13%	9	11.69%
>48 hours/week	10	26.31%	22	57.89%	6	15.79%
H/O mental disorder						
Yes	2	15.38%	8	61.54%	3	23.08%
No	27	19.85%	92	67.65%	17	12.5%
Co-morbidity						
Yes	8	22.22%	22	61.11%	6	16.66%
No	21	18.58%	78	69.03%	14	12.39%
Smoking						
Yes	4	14.81%	19	70.37%	4	14.81%
No	25	20.49%	81	66.39%	16	13.11%
Alcohol consumption						
Yes	1	11.11%	7	77.77%	1	11.11%
No	28	20%	92	65.71%	20	14.28%
Satisfied with monthly income						
Yes	19	30.16%	41	65.08%	3	4.76%
No	10	11.62%	59	68.60%	17	19.77%

Both the married and unmarried groups were under moderate stress mostly (66.94% % 67.85%).Doctors who had working hours<36 hours/week and 36-48 hours/week mostly showed moderate stress levels (70.58%, 70.13%), whereas 57.89% who worked for >48 hours/week had moderate 15.79% showed high stress. Those with a history of a mental disorder showed mainly moderate stress (61.54%) and 67.65% of doctors who had no history of mental illness had moderate stress. Doctors with co-morbidity showed mostly moderate stress (61.11%) the same as those who didn't have co-morbidity (69.03%). Moderate stress was found more commonly in smokers and nonsmoker doctors (70.37%, 66.39%). 77.77% of alcoholic doctors had moderate stress, whereas 65.71% of nonalcoholic doctors had the same. Both satisfied and dissatisfied doctors with their monthly income showed moderate stress levels (65.08%, 68.60%) but there was a high-stress level in dissatisfied doctors (19.77%) compared to satisfied (4.76%).

In table III, the result of the chi-square test is shown. The age group was significantly related to stress with a p-value of .0117, younger age groups were found tohave moderate stress, whereas the older group was on low stress. There were no significant correlations of stress level found with sex group (p value=.1057) marital status (p value=.2225), job (p value=.3961), working hour (p value=.6632), H/O mental illness (p value=.5552) or co-morbidity (p value=.6660), smoking (p value=.7922) and alcohol consumption (p value=.7449). But there was a significant correlation between stress level with satisfaction with the monthly income of a doctor, where p value=.0018. Doctors who were dissatisfied with their monthly earnings were more on stress.

Table III Chi-square test result between stress level and different variables

Variable	Stress			p-value
Age	low	moderate	high	
25-30 years	7 (8.76) [0.35]	29 (29.90) [0.03]	9 (6.34) [1.11]	.0117
31-35 years	8 (8.56) [0.04]	30 (29.23) [0.02]	6 (6.20) [0.01]	
36-40 years	7 (8.76) [0.35]	34 (29.90) [0.56]	4 (6.34) [0.87]	
41-45 years	1 (1.36) [0.10]	5 (4.65) [0.03]	1 (0.99) [0.00]	
>45 years	6 (1.56) [12.68]	1 (5.32) [3.50]	1 (1.13) [0.01]	
Sex				
Male	19 (15.77) [0.66]	55 (54.36) [0.01]	7 (10.87) [1.38]	.1057
Female	10 (13.23) [0.79]	45 (45.64) [0.01]	13 (9.13) [1.64]	
Marital status				
Unmarried	3 (5.45) [1.10]	19 (18.79) [0.00]	6 (3.76) [1.34]	.2225
Married	26 (23.55) [0.25]	81 (81.21) [0.00]	14 (16.24) [0.31]	
Current job				
Gov. doctors	15 (11.48) [1.08]	39 (39.60) [0.01]	5 (7.92) [1.08]	.3961
Private doctors	9 (10.12) [0.12]	37 (34.90) [0.13]	6 (6.98) [0.14]	
Postgraduate students	3 (4.28) [0.38]	15 (14.77) [0.00]	4 (2.95) [0.37]	
General practitioner	1 (0.78) [0.06]	2 (2.68) [0.17]	1 (0.54) [0.40]	
Temporary job	1 (2.34) [0.76]	7 (8.05) [0.14]	4 (1.61) [3.54]	
Working hours				
<36 hours	5 (6.62) [0.40]	24 (22.82) [0.06]	5 (4.56) [0.04]	
36-48 hours	14 (14.99) [0.06]	54 (51.68) [0.10]	9 (10.34) [0.17]	.6632
>48 hours	10 (7.40) [0.92]	22 (25.50) [0.48]	6 (5.10) [0.16]	
H/O mental disorder				
Yes	2 (2.53) [0.11]	8 (8.72) [0.06]	3 (1.74) [0.90]	.5552
No	27 (26.47) [0.01]	92 (91.28) [0.01]	17 (18.26) [0.09]	
Co-morbidity				
Present	8 (7.01) [0.14]	22 (24.16) [0.19]	6 (4.83) [0.28]	.6660
Absent	21 (21.99) [0.04]	78 (75.84) [0.06]	14 (15.17) [0.09]	
Smoking				
Yes	4 (5.26) [0.30]	19 (18.12) [0.04]	4 (3.62) [0.04]	.7922
No	25 (23.74) [0.07]	81 (81.88) [0.01]	16 (16.38) [0.01]	
Alcohol consumption				
Yes	1 (1.75) [0.32]	7 (5.98) [0.17]	1 (1.27) [0.06]	.7449
No	28 (27.25) [0.02]	92 (93.02) [0.01]	20 (19.73) [0.00]	
Satisfaction with monthly income				
Satisfied	19 (12.26) [3.70]	41 (42.28) [0.04]	3 (8.46) [3.52]	.0018*
Dissatisfied	10 (16.74) [2.71]	59 (57.72) [0.03]	17 (11.54) [2.58]	

Discussion

Among 149 participants, males (54%) were more than females (46%), similar to the study of West Bengal.[8] But the similar research of Sidhu TK et al had more female participants (54.7%).[3] The present study's most common age group was 36-40 years. However, in another same type of study, the common age group was 25-35 years.[9 10] In our study, stress levels were assessed using the PSS-10 scale. The majority (67.11%) of the participants had moderate stress levels. A similar result was found in Sidhuet al study.[3] But a study among resident doctors of Mumbai showed the stress of only 37.3%.[11] Significant statistical stress was seen in 36-40 years age group of doctors p= .0117, which was consistent with Sidhu et al.

But a study where stress levels of doctors were compared with nurses significant lower stress levels as compared to the age group of 31–40 years conducted by Sathiya et al.[12] Male (67.9%) and female (66.18%) doctors showed slightly different moderate stress levels which were statistically not significant p=.1057 which was not consistent with the study of Chatterjee et al Sidhu TK who found female were more stressed than males,they had more female participantsthat might be the explanation of it.[10,3] Our study found correlations of marital status, type of jobs, working hours, history of mental disorder, and co-morbidity were all statistically insignificant, the same as those conducted in South Africa.[13] But in the study of Chatterjee et al., unmarried doctors were more under stress.[10] A study in Jordan showed that general practitioners had more stress than others, and an analysis in Mumbai identified heavy workload with long working hours as a vital factor of stress.[14] [11] We found no statistically significant correlation between smoking (p=.7922) and alcohol consumption (p=.7449) with stress, whereas Logra et al found a relation between stress with smoking and alcohol consumption.[15] In the present study, stress was statistically significant between the doctors satisfied with monthly income and dissatisfied with monthly income. 58% of doctors were dissatisfied with a monthly incomep-value was .0018. A study conducted in BIRDEM also showed that low monthly income significantly affected doctors' mental conditions, although this study comprised only postgraduate trainee.[16] Another study in Southwest Ethiopia noted that sex, age and monthly salary were essential factors for stress in doctors.[17]

Limitations

There were some limitations to the study. The sample size was not that large. It was an online study, so only doctors who had access to smartphones, laptops or computers participated. Convenient sampling was done, so there might be sampling bias.

Conclusion

It can be said that young and dissatisfied doctors with income are more liable to perceive stress.The mental health of a doctor is as important as the physical. It should be addressed appropriately, and doctors who are under stress need proper counseling and medication if necessary to alleviate their stress.

Recommendation

Further study with large sample size has recommended.

Acknowledgement

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Disclosure

All the authors declared no competing interest.

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Original Article

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Association of Periodontal Disease and Type-2 Diabetic Patients in BIRDEM General Hospital

Muhammad Mubashirul Haque[1*] Rifat Rahman[2]

Abstract

Background: *Diabetes increases the risk of alveolar bone loss and additional loss comparing to non-diabetic individuals according to some epidemiological studies. A positive correlation between degree of glycemic control and disease prevalence and progression have long been considered as biologically linked. However proper understanding of its pathophysiology is a key for an appropriate treatment approach. The crucial aim of this present study was to learn the association between the periodontal disease and type-2 diabetes patients in BIRDEM Medical College and Hospital, Dhaka.*

Materials and methods : *This was a prospective cross-sectional study which was conducted at the Department of Dental Surgery in BIRDEM, Dhaka, Bangladesh. The study period was from January,2018-December 2020. The study subjects were 720 patients with different type of periodontal disease as well as type-2 diabetes mellitus. The data analysis was done by using the software MS-Excel 2016 & SPSS version 20.*

Results: *The mean age was 52.08±11.21 with a significant p value= p<0.0001. The most 204(28.33%) study subjects were in 50-60 age group. The correlation coefficient "R" and the coefficient determination "R square" between the chronological age of the diabetes mellitus patients and periodontal diseases.*

Conclusion: *Periodontal diseases may severely hamper the metabolic control of diabetes. For the improvement of diabetic condition, the treatment of periodontitis and decreasing of oral inflammation is needed to address properly.*

Key words

Chronological age; Diabetes mellitus; Periodontal disease.

Introduction

Periodontal ligament is the primary target of inflammatory tissue destruction in periodontal disease or periodontitis.[1] Diabetes mellitus is such a metabolic syndrome which is caused by abnormally high levels of glucose.[2] Periodontitis is basically the systemic inflammatory condition, insulin resistance, lipid and glucose metabolism where the diabetes mellitus is known as a well-predictable risk factor for periodontal disease.[3] Diabetes increases the risk of alveolar bone loss and additional loss comparing to non-diabetic individuals according to some epidemiological studies. A positive correlation between degree of glycemic control and disease prevalence is seen in some studies.[4,5,6] Chronic hyperglycemia results in production of Advanced Glycation End substances (AGEs) in the tissues, which have protein effects on the periodontal microenvironment.[7]

1. Assistant Professor Periodontology and Oral Pathology Ibrahim Medical College (Dental Unit) Dhaka.
2. Lecturer of Periodontology and oral Pathology Ibrahim Medical College (Dental Unit) Dhaka.

*Correspondence to :
Dr. Muhammad Mubashirul Haque
Cell: 01819 22 59 77
Email : Mubashirulms7777@gmail

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These two diseases have long been thought to be biologically linked in much extent.[8] To classify periodontal diseases several efforts have been taken by considering its etiology and clinical manifestations.[9] In 1999 the first international workshop on classification of periodontal diseases was held at Oak Brook (Illinois, USA) which was known as International Workshop for the Classification of Periodontal Diseases and Conditions. In that workshop a new classification of the diseases based on a comprehensive review of literature was made for international acceptance. The classification for periodontal diseases which was proposed are as follow: Gingival diseases (G) Chronic Periodontitis (CP) Aggressive Periodontitis (AP) Periodontitis as a manifestation of systemic diseases (PS) Necrotizing Periodontal diseases (NP) Periodontal Abscesses (PA) periodontitis with endodontic lesion, developed and acquired deformities and conditions.[10] The American Diabetes Association (ADA) admits that there is an association between periodontal diseases and diabetes and also claimed that periodontitis is mostly common in people with diabetes mellitus.[11] In 1999, a study recognized a bi-directional connection between periodontal diseases and diabetes and after that in 2000, the American Academy of Periodontology (AAP) moved for a strong public stand on this issue.[12] Now, the relationship of oral/periodontal diseases and type-2 diabetes has achieved the attention among healthcare professionals for substantial evidence which supportes the role of diabetes and poor glycemic control as important risk factors for periodontal diseases.[13] After conducting a randomized controlled trial study, a

research team recommended that the treatment of periodontal disease might reduce the blood sugar level of type-2 diabetes patients.[14] Hence, a clearer understanding of its pathophysiology is a crucial key for the proper treatment. The aim of the study was to identify the association of periodontal disease and type-2 diabetes patients in BIRDEM Medical College and Hospital. The objective of this cross-sectional study was tofind out the association of periodontal disease and type-2 diabetes mellitus patients attending in BIRDEM Medical College & Hospital, Dhaka, Bangladesh.

Materials and methods

This prospective cross-sectional study was conducted in the department of Dental Surgery in BIRDEM (Bangladesh Institute of Research & Rehabilitation in Diabetes Endocrine & Metabolic Disorders), General Hospital Dhaka, Bangladesh. The study period was from January 2018-December 2020. The study subjects were 720 patients with different type of periodontal disease as well as type-2 diabetes mellitus. Randomized purposive sampling technique was used for data collection and a structured questionnaire was also established for the study purpose. Patients who had type 2 diabetes mellitus along with the glycosylated Hemoglobin (HbA1c) level equal to or more than 7.0% were included in this study and patients without HbA1c or had its level less than 7.0% were excluded from the study. Periodontal index was followed according to Ramfjord (1967) whilst assessment of gingivitis was done according to Loe and Silness index (1967). Connotation of five periodontal health parameters by type-2 diabetes mellitus related factors were done by independent t-test, one-way ANOVA and Linear correlation. The data analysis was done by using the software MS-Excel 2016 and SPSS version 20. Statistical significance level was $p<0.05$.

Results

This study was conducted in response with 720 sample. Here, most of the study people 438(61%) were female and the remaining 282(39%) were male. Male female ratio was 47:73 & also p-value was statistically highly significant ($p<0.0001$) [Figure-1]. In the age distribution of the study subjects maximum 246(34.17%) found in 40-50 age range. Respectively, 204(28.33%) study subjects were in 50-60, 120(16.67%) in 60-70, 96(13.33%) in 30-40, and 54(7.50%) in >70 age range. The mean age was Mean±SD= 52.08±11.21 with a significant p value= $p<0.0001$ [Figure-2]. In the distribution of the patients according to the percentages of periodontal diseases, more than half 402(55.83%) of the study subjects found in periodontitis. Followed by 234(32.50%) had gingivitis, 36(5.00%) had periodontitis with endodontic lesion, 30(4.17%) had necrotizing periodontal diseases and the lest 18(2.50%) study patients had periodontal abscesses [Table I]. Statistically significant correlation of periodontal disease and chronological age of type-2 diabetes mellitus patients is shown in Table-II where p value was 0.014. Figure-3 showed a positive relation between chronological age and periodontal disease. The prevalence of the manifestation of disease increased with the chronological age. Table-III shows the summary of simple linear model, ANOVA analysis, coefficient determination. The correlation coefficient "R" and the coefficient determination "R square" between the chronological age of the diabetes mellitus patients & periodontal diseases. "R^2 =0.05" indicates that about 5% variation in periodontal diseases can be explained by chronological age of the patients. Rest of the 95% variation was due to other factors. In ANOVA analysis the correlation coefficient significant p-value = 0.01. With the α= 0.05 level of significance, enough evidence had been found to accomplish that the slope of the regression line was not zero and hence, there lies a positive correlation between periodontal diseases and chronological age of the patients. The prediction equation for this simple linear regression was Y (Dependent Variable) =60+0.31x (Independent Variable). This equation specifies that with every year increase of chronological age of the patients there occurred a 0.30% increase in the incidence of periodontal diseases.

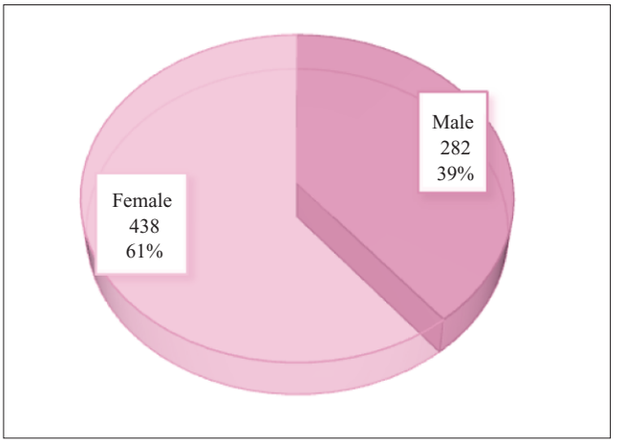

Figure 1 Gender distribution of the study patients (n=720)

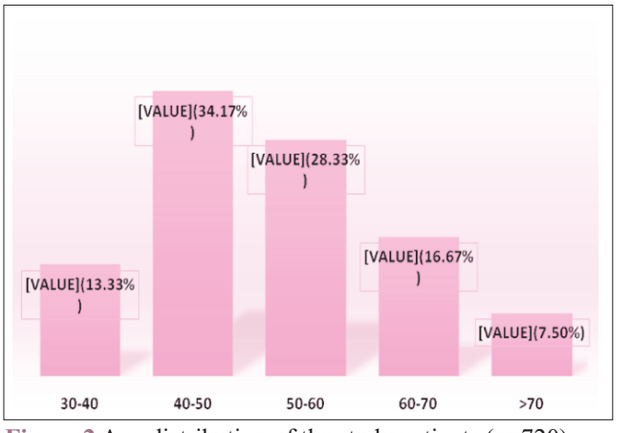

Figure 2 Age distribution of the study patients (n=720)

Table I Distribute the study patients according to the periodontal disease (n=720)

Name of periodontal diseases	n	%	p-Value
Gingivitis	234	32.50	
Periodontitis	402	55.83	
Necrotizing periodontal diseases	30	4.17	<0.0001
Periodontal abscesses	18	2.50	
Periodontitis with endodontic lesion	36	5.00	

Table II Association of periodontal disease and chronological age of type-2 diabetes mellitus patients (n=720)

Name of periodontal diseases	Chronological age (years)					Total	p-Value
	30-40	40-50	50-60	60-70	>70		
Gingivitis	60	114	41	12	7	234	0.014
Periodontitis	24	108	138	96	36	402	
Necrotizing periodontal diseases	0	16	7	1	6	30	
Periodontal abscesses	10	2	0	6	0	18	
Periodontitis with endodontic lesion	2	6	18	5	5	36	
Total	96	246	204	120	54	720	

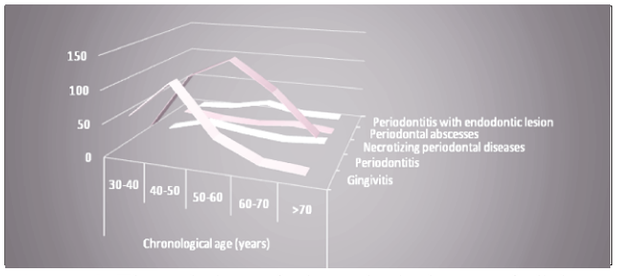

Figure 3 The relation of chronological age of diabetes mellitus patients and periodontal disease

Table 3 Summary of the result of statistical tests.

R. line	r	r^2	b	SE_b	DF	f	t	P value	95% Confidence Interval for B	
									upper	lower
0.31x+60	0.23	0.05	0.03	0.75	1	6.59	0.41	0.01	1.00	-1.07

R. line= Regression line, r= correlation coefficient, r^2=correlation determination, b= estimate of slope, SE_b=standard error slope, DF= Degree of freedom.

Discussion

In 2002 a population-based surveys in the USA on adult population found that 7.8 million people had diabetes, 90-95% had type 2 diabetes. Factually, in more than 95% individuals, type-2 diabetes was frequent and they were aged over 45 years old and had diabetes.[15] In 2010, another study also claimed that type 2 diabetes is mainly frequent in people aged over 40 and also affecting the young generation.[16] Here, in our study more than half of the study subjects 438(61%) were female and the remaining 282(39%) were male. Male female ratio was 47:73 and also p-Value was statistically highly significant (p<0.0001). In the age distribution of the study subjects maximum 246(34.17%) found in 40-50 age range. Respectively, 204(28.33%) study subjects were in 50-60, 120(16.67%) in 60-70, 96(13.33%) in 30-40, and 54(7.50%) in >70 age range. The mean age was Mean±SD= 52.08±11.21 with a significant P value= p<0.0001. A similar study where the mean age of participants was 57.8 years (Range: 33-75 years) and 61.6% of participants were male.[17] In our study maximum sufferer found female but that study found male patients. In the distribution of the patients according to the percentages of periodontal diseases, more than half 402(55.83%) of the study subjects found in periodontitis. Followed by 234(32.50%) had gingivitis, 36(5.00%) had periodontitis with endodontic lesion, 30(4.17%) had necrotizing periodontal diseases and the lest 18(2.50%) study patients had periodontal abscesses. Periodontal diseases are classified in accordance with the severity of the disease. In reality, gingivitis and periodontitis are sometimes the first evidence that a patient has diabetes.[18] A report of WHO claimed that gingivitis is one of the widest spread diseases in Bangladesh.[19] Moreover, gingivitis was found in nearly 75% of U.S. adults, around 13% had severe periodontitis, and 35% of them over age 30 had different form of periodontitis.[20] Statistically significant correlation of periodontal disease and chronological age of type-2 diabetes mellitus patients is shown in study where p value was 0.014. So, there lies a positive relation between chronological age and periodontal disease. The frequency of this disease increased with the chronological age. From the findings of this study, it can be said that with every year the chronological age increase of the patients there was 0.30% increase in the incidence of periodontal diseases. A tentative model for higher cognitive processes relating to periodontal care in reference to age was portrayed in 1990, with a simplified form. By assuming that the alveolar bone level at twenty-five years is 'normal', one will draw a line that is the essential limit of the extent of alveolar bone between the ages of twenty-five and seventy-five years. If the alveolar bone is coronal of the essential limit, the tooth (Person) may be considered safe. Periodontal treatment would then be thought of because the quantity of treatment necessary to get or maintain the oral health goal[21].

Limitations

The present study was carried out in a single hospital and the sample size was small which may not reflect the whole scenario.

Conclusion

Periodontal diseases may severely affect the metabolic control of type- 2 diabetes mellitus patients. On the contrary, the treatment of periodontal disease and decreaseof oral infection may have effectivity on the diabetic situation.

Recommendation

Self-care is needed in diabetes as well as oral health education for management of oral health should be more promoted, which may work as important prevention of diabetes related complications and improvement of quality of life.

Disclosure

All the authors declared no competing interest.

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Original Article

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Comparative Study of Carbamide Peroxide and Sodium Perborate for Bleaching of Discolored Teeth

Nazneen Karim[1*] Abu Saeed Ibn Harun[2] Abdul Hannan[3] Mst. Dilruba Khatun[4]

Abstract

Background: *Discoloration of teeth, especially in the anteriors, can result in considerably cosmetic impairment. Walking bleach in endodontically treated non-vital teeth by using sodium perborate mixed with 30% hydrogen peroxide is not always successful. The purpose of this study wasto evaluate and compare the clinical outcome of carbamide peroxide and sodium perborate mixed with 30% hydrogen peroxide for intracoronal bleaching of endodontically treated traumatized discolored anterior teeth.*

Materials and methods: *This randomized clinical trial was conducted in Conservative Dentistry & Endodontics, Department of Bangabandhu Sheikh Mujib Medical University, Dhaka, April 2015 to March 2016. A total of 60 traumatized permanent endodontically treated discolored anterior teeth having either A3/darker or C3/darker shade were selected. The patients were randomly dividedinto two groups. 30 teeth in Group A were treated with carbamide peroxide and 30 teeth in group B were treated with sodium perborate mixed with 30% hydrogen peroxide. All patients were evaluated clinically to assess the degree of colour changes during per-operative treatment and color stability (Re-discoloration) at the end of the treatment, three, six- and nine-month's interval.*

Results: *There was no statistically significant difference among the results between the two groups.*

Conclusion: *Clinical outcome of carbamide peroxidefor bleaching of discolored tooth is equally effective than that of sodium perborate mixed with 30% hydrogen peroxide.*

Key words

Carbamide peroxide; Discoloration; Non vital tooth bleaching; Sodium perborate mixed with 30% hydrogen peroxide.

Introduction

The discoloration of pulpless teeth could be a result of an aetiological factor (Trauma) or the endodontic procedure itself.[1,2] There are a number of non-vital bleaching techniques available, which include thermocatalytic, walking and in-office bleaching techniques by using different commercial bleaching agents such as hydrogen peroxide, sodium perborate and carbamide peroxide in walking bleach technique, a mixture of sodium parborate and 30-35% hydrogen peroxide is placed into the prepared cavity inside the pulp chamber followed by sealing of the cavity by a restorative material until the next visit. Application of bleaching gel is applied in each visit.[3] This technique needs to continue until matching of the color of effected tooth with the adjacent tooth.[4] Although the incidence of cervical root resorption associated with intracoronal bleaching is low, some authors recommend that it is safe to avoid hydrogen peroxide for intracoronal bleaching and sodium perborate can be used instead of hydrogen peroxide.[5] Different studies have demonstrated the effectiveness and safety of carbamide peroxide in removing intrinsic staining.[6]

Furthermore, the mechanism of carbamide peroxide in tooth bleaching has been investigated by some of the previous studies. One study indicated that it penetrates dentine less readily than hydrogen peroxide thus it may remain within dentine where it can effectively break down the chromogens more efficiently as opposed to hydrogen peroxide that penetrates dentine more readily.[5]

The adverse effect of Carbamide peroxide is also investigated. Previous studies have indicated that the side effects of carbamide peroxide are less severe than the hydrogen peroxide.It is neither carcinogenic, nor genotoxic, and not have more toxic effect than dental materials currently in use.Moreover, the transient effects with nightguard vital bleaching do not assist the walking bleach technique.[7]

Carbamide peroxide based bleaching agent (Endoperox, Septodont) has been introduced in dentistry for the bleaching of discolored non-vital teeth, which is found in powder form. Progressive whitening action occurs due to

1. Assistant Professor of Conservative Dentistry & Endodontics Chattagram International Dental Collage, Chattagram.
2. Associate Professor & Head of Conservative Dentistry & Endodontics Chattagram International Dental Collage, Chattagram
3. Lt Col & Classified Endodontist & Head of Conservative Dentistry & Endodontics Military Dental Center, Dhaka Cantt., Dhaka.
4. Assistant Professor, Head of Conservative Dentistry & Endodontics TMSS Medical College dental Unit, Bogur.a.

*Correspondence to :
Dr. Nazneen Karim
Cell: 01749 47 27 23
Email : nazneen2019.karim@gmail.com

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slow degradation of carbamide peroxide into hydrogen peroxide.[8] When in contact with physiological fluids, carbamide peroxide releases oxygen. This release occurs in an almost neutral medium. Its bleachingproperties are due to the oxidising power of active oxygen which is: a bleaching agent, a bactericide and a detergent by gas evolution.[9] However; few studies have been performed regarding its clinical outcome when used in endodontically treated non vital teeth.

Materials and methods

Based on the inclusion and exclusion criteria, a total of sixty traumatized permanent endodontically treated discolored anterior teeth (A3/darker shade or C3/darker shade) were matched for shade. The shade of the discolored tooth was recorded by three blind evaluators on the basis of a value-oriented shade guide (VITA Zahnfabrik, Bad Sackingen, germany) on the preoperative data sheet. Common finding among the three evaluators was finally judged as the preoperative shade. If the tooth was excessively dark, a color of "off-guide-brown" or "off-guide grey" was chosen. Shade of the adjacent normal tooth would also determine in the similar way. Photographs were taken with a digital camera to record the baseline shade of the tooth.

After isolation with cotton roll, the old restoration was removed, and the access cavity was cleaned. The endodontic filling was removed to a level of 2-3 mm below the cemento-enamel junction using Gates-Glidden drills. A layer of approximately 2 mm of self polymerization glass ionomer cement (type II) was placed coronal to the canal gutta-percha and the bleaching mixture was inserted in the pulp chamber. In group A, Carbamide peroxide (Endoperox, Septodont) powder and glycerol was mixed and in group B, Sodium perborate powder was mixed with 30% hydrogen peroxide solution in a ratio of 2:1 (g/ml).The pulp chamber was packed with the bleaching paste. A piece of dry cotton was placed over this mixture and the access cavity opening was sealed with glass ionomer cement. Then occlusion was cheeked.The bleaching agents were replaced weekly with a fresh material up to achieving the desired shade or for a maximum of five weeks. After the last bleaching session, the pulp chamber was filled with a paste of calcium hydroxide for 2 weeks to neutralize the bleaching agent. Then final restoration work was completed by placing resin composite (Giomer) in the pulp chamber. All patients were evaluated clinically to assess the degree of colour changes during per-operative treatment and color stability (Re-discoloration) at the end of the treatment, three, six- and nine-month's interval.

Collected data was analyzed using Statistical Package for Social Science (SPSS) version 19. Statistical analysis was performed by Chi-square (χ^2) test to assess the difference between the clinical outcome of Group-A and Group-B; a value of <0.05 was considered as statistically significant.

Results

Table I Distribution of teeth according to shade tab position at baseline and at the bleaching sessions

Shade tab position & shade	No. of teeth at baseline		No. of teeth after first bleaching		No. of teeth after second bleaching		No. of teeth after third bleaching		No. of teeth after forth bleaching		No. of teeth after fifth bleaching	
	n	%	n	%	n	%	n	%	n	%	n	%
1(B1)												
2(A1)					1	2	3	5	20	33.3	5	8.3
3(B2)												
4(D2)							6	10				
5(A2)					8	13.3	13	22	13	22	8	13.3
6(C1)												
7(C2)					3	5						
8(D3)			3	5	9	15	4	7	3	5	4	7
9(A3)			5	8.3	12	20	10	17	11	18.3		
10(D4)					1	2	3	5	1	2	4	7
11(B3)			1	2	5	5	11	18.3	4	7	2	3.3
12(A3.5)	5	8.3	10	17	10	17	2	3.3	2	3.3		
13(B4)			12	20	4	7	2	3.3			2	3.3
14(C3)			7	12	2	3.3	5	8.3	2	3.3		
15(A4)	19	32	8	13.3	7	12						
16(C4)	15	25	14	23.3								
* (B)	6	10										
* * (G)	15	25										
***Teeth	-	-	-	-	1	1.6	5	8.3	35	58.3	48	80
Total	60	100	60	100	60	100	60	100	60	100	60	100

* B=Off-guide brown**G=Off- guide grey*** Number of teeth that have completed the bleaching process at each session.

Table-II Comparison of bleaching efficacy between two groups at each bleaching session (n=30 at each group)

Bleaching session	Materials used	Bleaching upto the desirable shade		χ^2 value	p value
		Achieved No. (%)	Not Achieved No. (%)		
1st bleaching	Group-A (n=30)	0 (0.0%)	30 (100.0%)	-	-
	Group-B (n=30)	0 (0.0%)	30 (100.0%)		
2nd bleaching	Group-A (n=30)	1 (3.3%)	29 (96.7%)	1.017	0.313ns
	Group-B (n=30)	0 (0.0%)	30 (100.0%)		
3rd bleaching	Group-A (n=30)	2 (6.7%)	28 (93.3%)	0.218	0.640 ns
	Group-B (n=30)	3 (10.0%)	27 (90.0%)		
4th bleaching	Group-A (n=30)	17 (56.7%)	13 (43.3%)	0.069	0.793 ns
	Group-B (n=30)	18 (60.0%)	12 (40.0%)		
5th bleaching	Group-A (n=30)	23 (76.7%)	7 (23.3%)	0.417	0.519 ns
	Group-B (n=30)	25 (83.3%)	5 (16.7%)		

ns = Not significant.
Data were expressed in number and percentage.
Statistical analysis was done by Chi-square test.
The test of significance was calculated and p values <0.05 was accepted as level of significance.

Table II shows the comparison of bleaching efficacy of carbamide peroxide and sodium perborate mixed with 30% hydrogen peroxide at each bleaching session. It was observed that, the differences between the two groups in terms of success were not statistically significant (p>0.05).

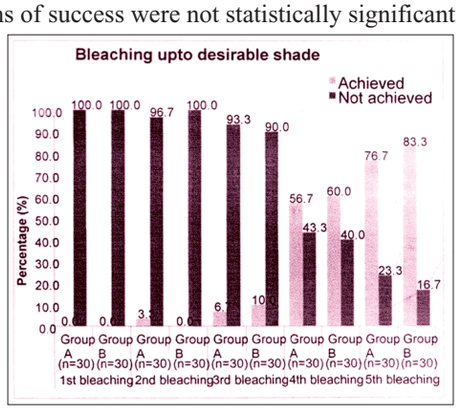


Figure 1 Bar diagram showing bleaching efficacy

Table III The mean of shade guide unit movement at each bleaching session by each material (n = 30 at each group)

Bleaching session	Materials used	No ofteeth*	M ± SD	T value	p value
1st bleaching	Group-A (n=30)	30	2.33±0.61	-0.695	0.490ns
	Group-B (n=30)	30	2.43±0.50		
2nd bleaching	Group-A (n=30)	29	2.33±0.88	-0.152	0.879 ns
	Group-B (n=30)	30	2.37±0.81		
3rd bleaching	Group-A (n=30)	28	2.20±1.09	1.618	0.111 ns
	Group-B (n=30)	27	1.70±1.29		
4th bleaching	Group-A (n=30)	13	3.33±1.12	1.715	0.092 ns
	Group-B (n=30)	12	2.73±1.55		
5th bleaching	Group-A (n=30)	7	3.60±1.07	1.054	0.296 ns
	Group-B (n=30)	5	3.27±1.39		

*Number of teeth bleached at the end of each session, excluding those that have reached desired shade
M = Mean of shade guide units' movement.
SD = Standard Deviation.

Data were expressed in mean and standard deviation. Statistical analysis was done by unpaired student t-test.

The test of significance was calculated and p values < 0.05 was accepted as level of significance.

Table III shows mean of shade guide unit movement at each bleaching session by carbamide peroxide and sodium perborate mixed with 30% hydrogen peroxide groups. It was observed that weekly evaluation did not reveal any significant difference between the groups in terms of efficacy score.

Table IV Comparison of color stability after successful

Visit	Materials used	Colour stability		χ^2 value	p value
		Acceptable No. (%)	Unacceptable No (%)		
End of treatment	Group A (n=23)	23 (100.0%)	0 (0.0%)	-	-
	Group B (n=25)	25 (100.0%)	0 (0.0%)		
At 3 months	Group A (n=23)	23 (100.0%)	0 (0.0%)	-	-
	Group B (n=25)	25 (100.0%)	0 (0.0%)		
At 6 months	Group A (n=23)	22 (96.7%)	1 (4.3%)	0.273	0.601 ns
	Group B (n=25)	23 (92.0%)	2 (8.0%)		
At 9 months	Group A (n=23)	21 (91.0%)	2 (8.7%)	0.140	0.708 ns
	Group B (n=25)	22 (88.0%)	3 (12.0%)		

Data were expressed in number and percentage.

Statistical analysis was done by Chi-square test.

The test of significance was calculated and p values <0.05 was accepted as level of significance.

Table IV shows the comparison of color stability between carbamide peroxide and sodium perborate mixed with 30% hydrogen peroxide groups following each observation period. It was observed that 6 and 9 months follow up period, the differences between two groups were not statistically significant (p>0.05).

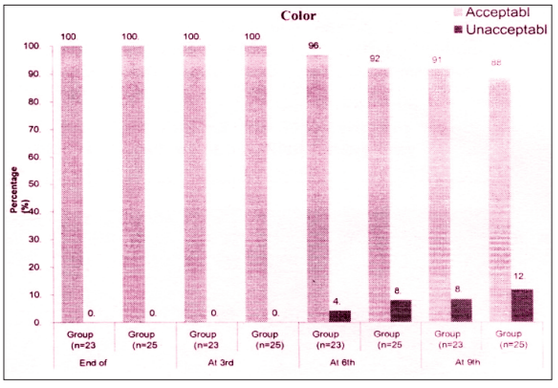


Figure 2 Bar diagram showing color stability

Discussion

Analysis of tooth shade before and after treatment is important for the evaluation of the degree of color change with the adjacent tooth. Several techniques have been applied to evaluate the degree of color change. According to Lim et al.[5] it is well established that visual color determination is subjective, compared to the accuracy of spectrophotometer evaluation. However, Vachon et al.[10] suggested that although the spectrophotometer reading might indicate a statistically significant difference, these differences could be clinically identical to the human eye. Therefore, a shade guide to assess the severity or degree of tooth discoloration has been previously used in dentistry. In this study, color changes in each tooth were evaluated using vita shade guide under standardized lighting condition.

Intracoronal bleaching is an eatablished, simple, conservative and cost effective method of improving the aesthetic appeal of discolored teeth that have root treated.In the present study, the bleaching efficacy of carbamide peroxide was compared with sodium perborate mixed with 30% hydrogen peroxide in endodontically treated discolored anterior teeth.

Regarding case selection, both brown and grey color of teeth were chosen in the point of view that brownish tooth color denoting with A3 or darker shade whereas grey represents C3 or darker shade determined according to Vita lumen shade guide. This study model was previously followed by Waterhouse P. J. et al.[11]

The results of the present study showed that all teeth gradually achieved some improvement of the color but did not reach the desired bleaching shade. Five bleaching sessions were carried out. After the first bleaching session, no teeth bleached to the desired shade in both 100% carbamide peroxide and sodium perborate mixed with 30%

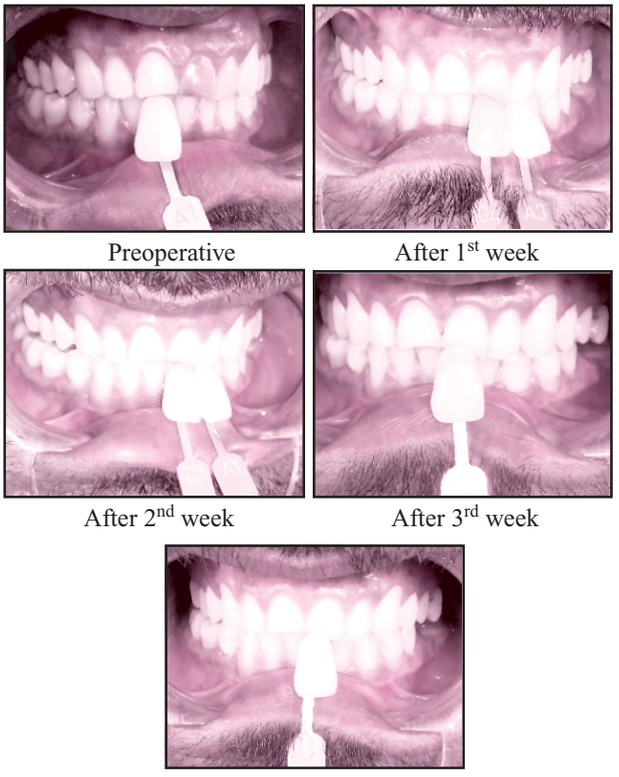
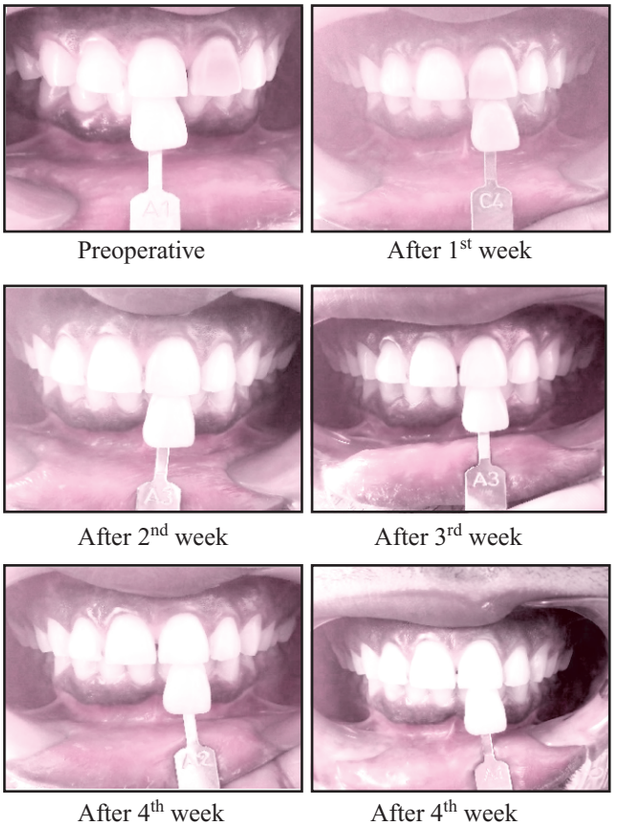


Figure 3 Carbamide peroxide in bleaching of a patient having grey discoloration

hydrogen peroxide group. The mean of shade guide unit movement by carbamide peroxide and sodium perborate was 2.33±0.61 and 2.43±0.50, respectively. The Similar results were reported by Lim et al and Weiger et al.[5,12] They observed that bleaching agent had a slower onset of action; they did not achieve significant tooth lightening at the first bleaching session. At the end of the 2nd bleaching session, it was observed that carbamide peroxide bleached one tooth (3.3%) to the desired shade while sodium perborate did not show similar effect in tooth with matched shade. The mean of shade guide unit movement by carbamide peroxide and sodium perborate was 2.33±0.88 and 2.37±0.81, respectively. However, at the end of the 3rd session, it was found that carbamide peroxide bleached two teeth (6.7%) to the desired shade while sodium perborate showed similar effect in three (10.0%) teeth with matched shades. The mean of shade guide unit movement by carbamide peroxide and sodium perborate was 2.20±1.09 and 1.70±1.29, respectively.

At the end of the forth bleaching session, 17 (56.7%) carbamide peroxide and 18 (60%) sodium perboratebleached teeth had achieved maximum bleaching effects.



Preoperative | After 1st week

After 2nd week | After 3rd week

After 4th week | After 4th week

Figure 4 Sodium perborate mixed with 30% hydrogen peroxide in bleaching of a patient having grey discoloration

The mean of shade guide unit movement by carbamide peroxide and sodium perborate was 3.33±1.12 and 2.73 ±1.55, respectively.

Furthermore, in the fifth session, the 23 (76.7%) carbamide peroxide and 25 (83.3%) sodium perborate bleached teeth had achieved maximum bleaching effects. The mean of shade guide unit movement by carbamide peroxide and sodium perborate was 3.60±1.07 and 3.27±1.39, respectively. No significant differences were found between the two bleaching materials used in the present study in any session. This is similar to a previous report of Ganesh et al that there was no significant difference between the bleaching action of carbamide peroxide and sodium perborate. On the other hand, the result is contrary to the findings of Lim et al and Umanah et al that 35% carbamide peroxide mixed with hydrogen peroxide were more effective than sodium perborate at the first bleaching session.[13,5,14] The differences between the present study with that of previous studies may be due to the differences in mixing the sodium perborate. In the present study, sodium perborate was mixed with 30% hydrogen peroxide while the previous studies used the distilled water. The remaining teeth did not achieve the desired shade and therefore discarded from the color stability observation.

Color stability was observed in successful bleached teeth at 3, 6 and 9 months. Among the 23 cerbamide peroxide and 25 sodium perborate with 30% hydrogen peroxide bleached teeth, it was found that relapse was observed at six months follow up in 3 participants (1 in group A & 2 in group B) followed by 5 participants (2 in group A & 3 in group B) at nine months follow up. This is also supported by Umanah et al who reported that at six months recall, relapse was observed in 3(8.8%) teeth treated with CP.[14] The actual reason of relapse was not clarified in the present study but it may be due to chemical reduction of the oxidation products formed as a result of bleaching with hydrogen peroxide.[11] Another reason may be due to microleakage of composite resin restoration that facilitates entry of bacterial and chemical by products and results in further discoloration.[15] Furthermore, due to microcracks, the permeability of tooth structure may be increased that can lead to discoloration from saliva or tissue fluid.[16,17]

Conclusion

It can be concluded that 100% carbamide peroxide mixed with glycerol is superior to sodium perborate mixed with 30% hydrogen peroxide in respect to color stability during the 9 months follow up period.This study was performed to assess the color change by using Vitapan classical shade guide (Zahnfabrik, Bad Sackingen, Germany) which is subjective and limited in color range.Another limitation was the relatively short postoperative follow up period.

100% Carbamide peroxide can be used as an alternative intracoronal bleaching material.

Recommendation

Further research is necessary with long term clinical evaluation and a larger sample size to confirm the results.

Disclosure

All the authors declared no competing interest.

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Case Report

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Volume 05 Issue 02 July 2022; 25-28

Endodontic Microsurgery for Type II Dens Invaginatus with Periapical Lesion : A Case Report

Md. Abu Saeed Ibn Harun[1*] Md. Shahedur Rahman Hera[2]

Abstract

Background: *The Dens Invaginatus (DI) is ananatomical abnormality of tooth. The management of DI is very much difficult in non-surgical root canal treatment. RCT combined with root end surgery is recommended for DI and provide good prognosis.*

Case Presentation : *16 years old female patient with diagnosed periradicular infection. Intra oral examination and periapical radiographed revealed the sign of DI type II. This case was managed by RCT combined with micro endodontic surgery. After 2 weeks initial heal was occurred and symptoms of periapical periodontitis was subsided.*

Conclusion: *Root Canal Treatment (RCT) combined with micro endodontic surgery provides a good prognosis for type II DI with periradicular pathosis.*

Key words

Dens invaginatus; Microsurgery; Periodontitis.

Introduction

Endodontic surgery is a dental operation used to treat apical periodontitis when non-surgical treatment has failed or when initial root canal therapy has failed.[1] This might include situation with persistent or refractory intracanal infection after iatrogenic changes to the original canal anatomy or microorganism in proximity of the constriction and the apical foramen or extra radicular infection, such as bacterial plaque on the apical root surface or bacteria within the lesion itself.[2,3]

One of the most dangerous tooth abnormalities is Dens Invaginatus (DI). In Oehlers type II DI, the invagination extends beyond the crown of the tooth and into the root, beyond the Cement-Enamel Junction (CEJ).[4] These lesions may or may not involve pulp, but they always stay within the root architecture.If the invagination involves the pulp, it allows irritants and microorganisms to aggregate and directly infect the pulp,leading to pulp infection, necrosis and a periapical lesion.[5,6] Type II DI is very challenging to treat because of the complexity of the anatomic morphology and wide foraminal opening. The traditional first-line recommendation for DI is Root Canal Treatment (RCT) combined with root end surgery. Although this procedure also provides a good prognosis for type II DI.[7]

Endodontic Microsurgery (EMS) is the most recent step in the evolution of peri radicular surgery, applying not only modern ultrasonic preparation and filling materials but also incorporating microsurgical instruments, high-power magnification and illumination.[8] So, the aim of thiscase report is the endodontic microsurgery for dens II type DI with periapical lesion.

1. Associate Professor of Conservative Dentistry and Endodontic Chattagram International Dental College, Chattogram.
2. Research Associate of Conservative Dentistry and Endodontic Chattagram International Dental College, Chattogram.

*Correspondence to :
Dr. Md. Abu Saeed Ibn Harun
Cell: 01711 15 75 86
Email : drharunpg@yahoo.com

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Case Report

On 19th April 2022 16 years old female patient was referred to Department of Conservative Dentistry and Endodontics Chattogram International Dental College with the complain of pain and previously received endodontic treatment initiated by general dentists.Intraoral examination often revealed specific crown morphology, a cone shape. Periapical radiographic examination revealed the radiolucency and sign of type II DI.

Diagnosis and Treatment Planning

We diagnosed the patient with Oehlers type II with endodontic treatment initiation and apical periodontitis. We discussed the treatment options including endodontic microsurgery. After the possible risks and benefits were explained, this patient (with her guardian) opted to received endodontic microsurgery and entire canal obturated by MTA.

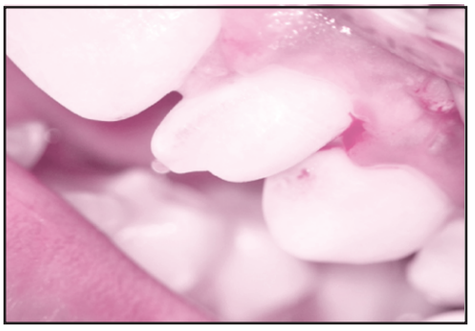

Figure 1 Conical Shape tooth

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Figure 2 Invagination of root with periapical lesion

Endodontic Treatment Canal of Invaginated Root

Previously prepared endodontic access cavity was irrigated with 1.25% NaOCl and activated by XP finisher (FKG, Switzerland) for 30 second. Root canal of invaginated root was detected under magnification (8X). The main canal was explored with a size 10 K-file (Dentsply Maillefer, Switzerland). The working length of the invaginated root was determined with radiographical technique. Glide path was prepared by no 15 K-file. The invaginated canal was prepared by XP shaper and XP finisher (FKG, Switzerland) under copious irrigation with 1.25% NaOCl. Following preparation, the primary and invaginated root canals were irrigated successively with 1.25% NaOCl, normal saline, 17% EDTA, normal saline, 1.25% NaOCl, normal saline. Following drying with sterile paper points, the invaginated root canal was obturated by MTA without gutta-percha. Surgical management of the apex in a same session was planned, and the access cavity was sealed with temporary filling material.

Endodontic Microsurgery for Apex

Following the disinfection of operation site and administration of local anesthesia(2% lidocaine with adrenalin 1/80000) the full-thickness mucoperiosteal flap was raised (Fig-3). After apical osteotomy to the visual lesion, the granulomatous lesion was excised by curettage. The root end was resected about 3 mm. Bleeding was stopped 4-layer pressure pack with adrenaline wet cotton pellet. Root end was inspected under the magnification (16X). The main root canal was debrided with 1.25% NaOCl solution. The root end was prepared by ultrasonic tips (Endo success, Acteon). Retrograde filling was made by MTA (Millue, Japan). The position of MTA was confirmed with radiographs. Surgical site was closed by Vicryl 4.0 round.

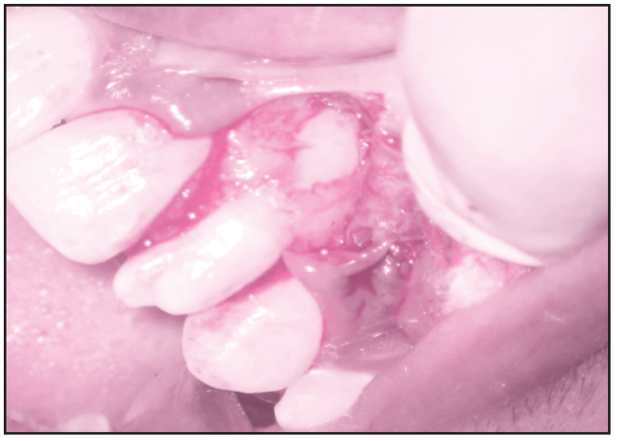

Figure 3 Fenestration of root surface

Figure 4 Resected 3 mm of the root

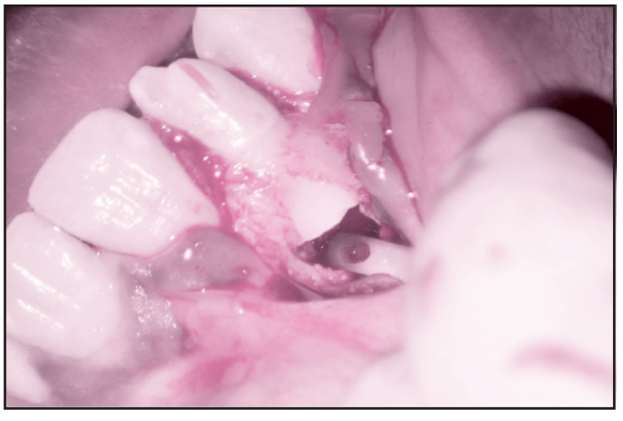

Figure 5 Inspection of prepared periapical region of root

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Figure 6 After immediate of microsurgery

Discussion

Endodontic care is frequently required to save and treat the damaged tooth since dens invaginatus is frequently associated with pulp and periradicular disorders, although it is often difficult due to the varied and aberrant anatomy.[9] This presented case was previously initiated endodontic treatment with periapical lesion. So, we had been planned for pseudocanalby non-surgical followed by endodontic microsurgery. Pseudocanal was obturated with MTA.

Anatomical complexity of the root canal system and the presence of microbes as surface adherent biofilm structure serve as the foremost challenges in root canal disinfection in non-surgical endodontic treatment.[10] We used XP-endo shaper and XP-endo finisher for biomechanical preparation with presences of 1.25% NaOCl as irrigating solution. The XP-endo finisher, as an irrigation agitation technique, may help to remove biofilm from hard-to-reach areas in the root canal system.[11]

Prepared invaginatus canal was obturated by MTA. Endodontic care is frequently required to save and treat the damaged tooth since dens invaginatus is frequently associated with pulp and periradicular disorders, although it is often difficult due to the varied and aberrant anatomy.[12] Moreover, the particle size and dimensional shape of MTA can occlude and penetrate dentinal tubules that might harbor microorganisms after cleaning and shaping[13]. MTA not only meets the ideal bacteriostatic criteria, but it also has the potential to be bactericidal. The release of hydroxyl ions, a long-term high pH, and the creation of a mineralized interstitial layer may present a difficult environment for bacteria to survive.[14] Freshly mixed MTA has antifungal activity against Candida albicans those are commonly present in refractory endodontic disease and antibacterial properties against Entercoccocus faecalis, a microorganism prevalent in root canal failures.[15,16]

Treatment of teeth with dens invaginatus and a periapical pathology might require adjunctive treatment approach depending on the anatomical complexity. In the present case report, endodontic microsurgical was planned. Surgical management also provided curettage of the periapical lesion. In the present case report, MTA was used as retrograde filling. Endodontic Microsurgery (EMS) is the most recent step in the evolution of peri radicular surgery, applying modern ultrasonic preparation and biocompatible retrograde filling materials with incorporating microsurgical instruments, high-power magnification and illumination.[17] In the present case report, ultrasonic radicular preparation has done under high power magnification and illumination.

Conclusion

Based on the successful evidence finding, the non-surgical and surgical endodontic management and the use of MTA obturation are increase the possibility of success in type II dens invaginatus and periapical lesion.

Disclosure

All the authors declared no competing interest.

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206/1, Haji Chand Meah Road, Shamserpara, Chandgaon, Chattogram, Bangladesh.
Phone : +880-31-2573119-23, Fax : +880-31-672062, E-mail : shahique_jpni@yahoo.com
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Correspondence to : Dr.

Cell :

Email :

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206/1, Haji Chand Meah Road, Shamserpara, Chandgaon, Chattogram, Bangladesh.
Phone : +880-31-2573119-23, Fax : +880-31-672062, E-mail : shahiq_ipni@yahoo.com
web : www.cidch.edu.bd