JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Title; Prevalence of periodontitis in type 2 diabetics and non diabetics cases in Hirebagewadi, Belgaum district : observational study

Dr Deepa Magdum, Dr Shapethi, Nolita Dolcy Saldanaha, Dr Shivayogi Charantimath, Dr Kumarswamy

senior dental health officer, Director, Research Associate, Reader, Professor B.I.M.S HOSPITAL Belgavi, Indian Institute Of Public Health . Bangalore., Indian Institute Of Public Health . Bangalore., K.L.E.V.K. Institute Of Dental Sciences KLE Academy of Higher Education and Research, B.I.M.S.Belagavi

Abstract

Background: Diabetes mellitus (DM) is a systemic disease leading to several major complications affecting both the quality and the duration of life. Diabetes is certain to be one of the most challenging health problems in the 21st century. Diabetes is the fourth leading cause of death in most developed countries. The existing prevalence of self-reported type 2 diabetes mellitus (T2DM) in India Karnataka is 24.6%. Periodontitis is responsible for increasing insulin resistance and poor glycemic control, thus worsening the condition of diabetics. Periodontal diseases are prevalent both in developed and developing countries and affect about 20-50% of global population. High prevalence of periodontal disease in adolescents, adults, and older individuals makes it a public health concern. The aim of this study was to assess periodontal disease in diabetic patient and compare with nondiabetic.

Methods: A cross sectional study was carried out in dental OPD at CHC Hirebagewadi Belgaum district under purposive sampling. The study duration was 3 months. Qualitative data was collected using Structured Questionnaire to assess the oral hygiene practices. Study tool by using WHO Oral Health Assessment Form for Adults and Periodontal index was used. Patients, within the age group of 30–65 years, diagnosed as T2DM for based on criteria given by the WHO. RBS was measured by chair side digital glucometer. All the participants

were subjected for oral examination using diagnostic instruments and WHO oral health assessment with periodontal index was entered.

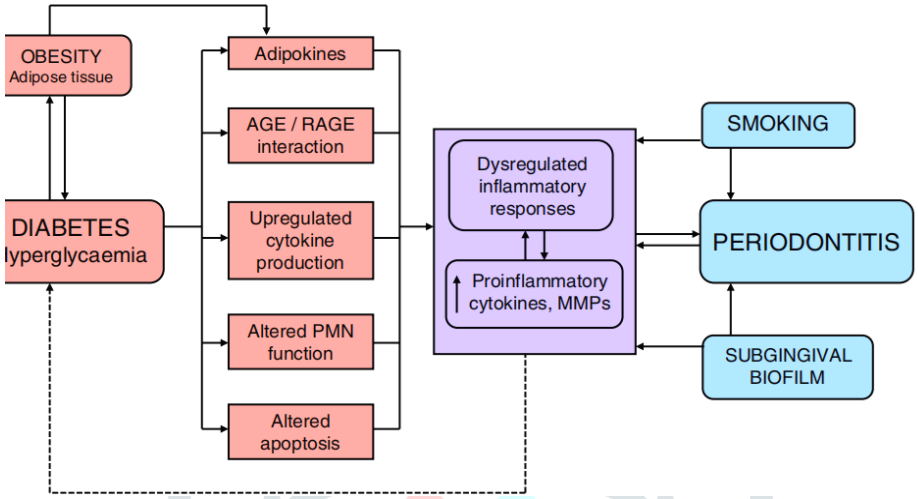
Results: Descriptive analyses were obtained. Continuous group were compared by independent t test and categorical group were compared by chi square test. A prevalence of periodontal disease in diabetic and non-diabetic patients was obtained and comparison was done with chi square. this was categorized as healthy, mild, moderate, and severe. In diabetic group 12.6% were healthy, 44,0% had mild periodontitis,29.3% had moderate,21% had severe periodontitis. In non-diabetic group 76.0 % were healthy ,14.6% had mild,6.00 % moderate and 3.33% in severe periodontitis. When comparison was done between two groups a p-value was significant with 0.0001 which is statistically significant and states that prevalence of periodontal disease in more common in diabetic group

CONCLUSION: Our study has made an attempt to determine the association between type 2 DM (NIDDM) and periodontal disease in Bangalore city. It was found that type 2 DM (NIDDM) subjects manifested relatively higher prevalence and severity of periodontal disease as compared with non-diabetics. In conclusion, periodontal disease was more prevalent and severe in type 2 DM patients as compared with non-diabetic subjects Decreased periodontal disease burden can minimize treatment needs and can reduce financial impact on health care systems. High prevalence of periodontal disease also necessitates the establishment of surveillance system for oral diseases in the community

INTRODUCTION

Diabetes mellitus (DM) is a systemic disease leading to several major complications affecting both the quality and the duration of life. Diabetes is certain to be one of the most challenging health problems in the 21st century. It is now one of the most common non-communicable diseases globally. Diabetes is the fourth leading cause of death in most developed countries, India leads the world today with the largest number of diabetics in any given country. In the 1970s, the prevalence of diabetes among urban Indians was reported to be 2.1%, and this has now risen to 12.1%. According to the World Health Organization (WHO) projections, the present 30 to 33 million diabetics in India will go up to 74 million by 2025. The WHO has issued a warning that India will be the “Diabetes Capital of The World.”The prevalence of diabetes in India is diverse in different region of the

country. The National Urban Survey conducted across the metropolitan cities of India reported 11.7% in Kolkata (East India), 6.1% in Kashmir Valley (North India),11.6% in New Delhi (North India), 16.6% in Hyderabad (South India), 13.5% in Chennai (South India), 9.3% in West India (Mumbai), and 12.4% in Bangalore (South India). Literature search have reveled relation of diabetes mellitus and periodontitis. [1,2, 3,4,5,6,7,8,]



Schematic representation of the proposed two-way relationship between diabetes and periodontitis [5].Hence to evaluate relation between diabetic and periodontistis this study was undertaken in rural population in Belgavi district.

AIM: To assess the prevalence and severity of periodontal disease in type 2 DM (NIDDM) patients in Hirebagewadi to compare the findings with non-diabetics.

0bjectives

1. To determine the prevalence of periodontitis in type 2 diabetes mellitus (T2DM) patient's
2. To compare the prevalence of periodontal disease in type 2 diabetes mellitus (T2DM) patient's with non-diabetic patient.

Materials and methods : This cross sectional study consisted of patients attending the dental OPD at CHC Hirbagewadi under purposive sampling. This study duration was 3 months. Structured Questionnaire to assess the oral hygiene practices and WHO Oral Health Assessment Form for Adults was used as study tool .All patients underwent Oral examination and periodontal index was noted. Clinical parameters: All the

participants were subjected for oral examination using diagnostic instruments. A partial mouth periodontal examination (PMPE) protocol which assessed fewer sites yet still estimating the overall periodontal status except for Gingival Index (GI) probing pocket depth (PPD), andclinical attachment loss (CAL) gingival bleeding. Systemic and health parameters: RBS as measured by chair side digital glucometer and assistance will be taken by NCD cell.

Inclusion criteria 1] Patients, within the age group of 30–65 years, diagnosed as T2DM for based on criteria given by the WHO [8,9] , 2] Having not ≤ 20 remaining teeth in oral cavity3] Patients, within the age group of 30–60 years, diagnosed as non T2DM.

Exclusion criteria1.1Patients under medication for antihypertensive and antiepileptic. 2. Females who were pregnant, lactating, 3. Patients who have undergone periodontal treatment over the preceding 6 months. 4. Based on clinical examination participants with suspected periapical pathology, orthodontic appliances, and multiple systemic complications of diabetes mellitus were also excluded from the study.

Results and observation

All 300 patients' answers and health parameter data was collected after obtaining informed consent from patients. The descriptive data obtained was analyzed using spss software version 17. Continuous group were compared by independent t test and categorical group were compared by chi square test. Reliability of questioner and validation was done. The questioner elicited information on demographic data and health parameter data. [Enclosed Questioner Annexure 1]. The data entered was categorized into 2 groups. Diabetic and non-diabetic group. WHO proforma [Annexure2],

A prevalence of periodontal disease in diabetic and non-diabetic patients was obtained and comparison was done with chi square. this was categorized as healthy, mild, moderate, and severe. In diabetic group 12.6% were healthy, 44,0% had mild periodontitis,29.3% had moderate,21% had severe periodontitis. In non-diabetic group 76.0 % were healthy 14.6% had mild,6.00 % moderate and 3.33% in severe periodontitis. When comparison was done between two groups a p-value was significant with 0.0001 which is statistically significant and states that prevalence of periodontal disease in more common in diabetic group.table 1.

Table: 1 Prevalence of periodontal disease in diabetic and non-diabetic patients

Groups	Healthy	%	Mild	%	Moderate	%	Severe	%	c^2	p-value
Diabetic	19	12.66	66	44.00	44	29.33	21	14.00	123.3730	0.0001*
Non-diabetic	114	76.00	22	14.67	9	6.00	5	3.33		
Total	133	44.33	88	29.33	53	17.67	26	8.67		

*p<0.05

All participants were examined for pocket dept using CPIN modified table. A pocket dept was measured and recorded. A highest score of periodontal pockets dept was considered .in diabetic patients 87.33% of participants had periodontal pocket dept. a total of 24.00% in non-diabetic group was seen. When both were compared a p value of 0.0001 was obtained which is statistically significant and this gives clear indication that diabetic patients had periodontal pocket as compared to non-diabetic patients.

Comparison of diabetic and non-diabetic patients with Gi scores and number of teeth examined was recorded. The scores were calculated by mean and standard deviation and unpaired t test. In our study t value of 34.0301 and p value of 0.0001 was obtained which is significant as gives clear indication that there is association between bleeding and diabetic condition.

Table:2 Comparison of diabetic and non-diabetic patients with GI scores and number of teeth examined by unpaired t test

Variables	Diabetics		Non-Diabetics		t-value	p-value
	Mean	Std.Dev.	Mean	Std.Dev.		
GI scores	0.92	0.09	0.43	0.15	34.0301	0.0001*
No of teeth examined	30.96	3.99	23.12	6.68	12.3317	0.0001*

*p<0.05

Discussion

Diabetes mellitus (DM) is a systemic disease leading to several major complications affecting both the quality and the duration of life.. DM is a systemic disease commonly associated with periodontal diseases. [4]. Several investigators have reported a higher incidence and severity of periodontal disease in type 2 (NIDDM) diabetic

patients as compared with non-diabetic controls. The current study is undertaken to assess the prevalence and severity of periodontal disease in type 2 DM (NIDDM) patients in Hirebagewadi and to compare the findings with non-diabetics.

This study is a cross sectional study, consisted of patients attending the dental OPD at CHC Hirbagewadi with purposive sampling sampling. The study duration was 3 months. Structured Questionnaire to assess the oral hygiene practices was used and study tool was oral health assessment form for adults WHO proforma, Periodontal status (CPI modified) (WHO), loss of attachment.

Patients, within the age group of 30–65 years, diagnosed as T2DM for based on criteria given by the WHO [8,9,10,11], not ≤ 20 remaining teeth in oral cavity, Patients, within the age group of 30–60 years, diagnosed as non T2DM were included in the study. Patients taking antihypertensive and antiepileptic medications, pregnancy, and lactating, undergone periodontal treatment over the preceding 6 months were excluded from the study. Based on clinical examination participants with suspected periapical pathology, orthodontic appliances, and multiple systemic complications of diabetes mellitus were also excluded from the study. Systemic and health parameters: RBS as measured by chair side digital glucometer and assistance will be taken by NCD cell.

Clinical parameters: All the participants will be subjected for oral examination using diagnostic instruments. All patients were examined according to the WHO proforma of oral health assessment using CPI modified index. Gingival bleeding, and pocket depth, and loss of attachment was recorded. In our study a total of 300 patients were selected and examined a random blood sugar level was recorded and periodontal index cpi was recorded. This periodontal index includes bleeding scores, pocket depth, loss of attachment. The descriptive data was analyzed using spss software. Continuous group were compared by independent t test and categorical group were compared by chi square test. Reliability of questioner and validation was done. The questioner elicited information on demographic data and health parameter data. The data entered was categorized into 2 groups. Diabetic and non-diabetic group.

The prevalence of periodontal disease in diabetic patients was significant. in diabetic patients out of 150 patients 12.66% were healthy,44.0 % mild,29.35% moderate,14% had severe periodontitis.in no diabetic patients 76.0% were healthy, 14.6% mild,6.00% moderate, and 3.33% severe periodontitis. This result was

statistically significant. This is in accordance with study done by Singh et al where in her study 95.1% of diabetic patients had periodontitis.

All participants were examined for pocket dept using CPIN modified table. A pocket dept was measured and recorded. A highest score of periodontal pockets dept was considered .in diabetic patients 87.33% of participants had periodontal pocket dept. a total of 24.00% in non- diabetic group was seen. When both were compared a p value of 0.0001 was obtained which is statistically significant and this gives clear indication that diabetic patients had periodontal pocket as compared to non-diabetic patients which was seen in study done by Singh et al. The average PPD of the diabetic patients reported in the study was 3.27 ± 0.051 mm. In all the four categories glycemic control, the mean PPD recorded was 2.40 ± 0.097, 2.89 ± 0.101, 3.15 ± 0.081, and 3.79 ± 0.073 mm in normal, good, moderate, and poor glycemic control, respectively ($P < 0.001$). The mean PPD found to be significantly different and higher in poor glycemic control groups as compared to normal glycemic group according to Singh[12]

Comparison between diabetic and non-diabetic patients with Gi score and number of teeth examined by unpaired t test was significant. The study done by Monika singh also had similar results 1.684±0.031 1.7 (0.33-3.83) GI 1.253±0.014 1.2 (0.54-2.66). [12]

The prevalence of periodontitis in this study has been reported as 95.1% among diabetic patients. As in the present study, Kumar et al. [13] also reported prevalence of periodontitis 91.7% among diabetic participants in Bareilly region.

Saito et al found an increase in mean pocket depth that was more closely associated with the development of glucose intolerance from normal status than the past glucose tolerance status itself. Similar to the present result, Kumar also showed higher mean CAL for poor glycemic control, as compared to in good glycemic control patients. this was in accordance with our study that maximum number of patients had pocket depth more than 1mm in our study.

Our study has shown the prevalence of periodontal disease to be more severe in diabetic patients as compared with non-diabetics,in accordance with various studies by Bacic et al., Emrich et al., Tervenon and

Oliver, Cerda et al., Mortan et al., Novanes Junior et al., Soskolne, Grossi and Genco, Almas et al., Campus et al. and Mealey and Oate.[14,15,16,17]

Interesting observations of our study :

1. As the duration of diabetes increases, the severity of periodontal disease increases

2. Prevalence of periodontitis according to healthy, mild, moderate, and severe was 12.6%,44.00%,29.3% and 14.00% respectively.

3. The gi score and number of teeth examined was compared and result was significant.

4. When association between periodontitis and gender was carried out 43.71 % were healthy, 31.13% had mild periodontitis 15.23% had moderate and 9.93 % had severe periodontitis in male and females 44.97 % were healthy, 27.52 % had mild, 20.13% moderate and 7.38% severe periodontitis.

Conclusion

Diabetes mellitus is reaching potentially epidemic proportions in India. The level of morbidity and mortality due to diabetes and its potential complications are enormous, and pose significant healthcare burdens on both families and society. Yet despite the increase in diabetes there remains a paucity of studies investigating the precise status of the disease because of the geographical, socio-economic, and ethnic nature of such a large and diverse country.

The reduction in the incidence and prevalence of periodontal disease can result in lowering its associated systemic diseases and complications. Decreased periodontal disease burden can minimize treatment needs and can reduce financial impact on healthcare systems. High prevalence of periodontal disease also necessitates the establishment of surveillance system for oral diseases in the community. Preventive programs for periodontal disease should utilize common risk approaches to reduce the magnitude of other chronic diseases.

The clinical and epidemiological evidence found in the literature we reviewed provides support for the concept that DM can have adverse effects on PD, that PD worsens in parallel with glycemic control and finally that PD is associated with an increase in the risk for diabetes-related complications.

However, further prospective, rigorous, controlled trials with a larger number of patients, in ethnically diverse populations are necessary to establish these relationships and that treating PD can positively influence glycemic control and possibly reduce the burden of diabetes-related complications.

Our study has made an attempt to determine the association between types 2 DM (NIDDM) and periodontal disease in Hirebagewadi. It was found that type 2 DM (NIDDM) subjects manifested relatively higher prevalence and severity of periodontal disease as compared with non-diabetics. In conclusion, periodontal disease was more prevalent and severe in type 2 DM patients as compared with non-diabetic subjects. All patients diagnosed with periodontal disease should be screened for diabetic status .This will help in early diagnosis and prevention of both periodontal disease and diabetic status.

Recommendation

1] All patients visiting the dentist in government hospital to be examined thoroughly to evaluate periodontal disease.

2] All patients above 35 yrs. should be checked for diabetic status i.e. random blood sugar level and HB1 AC.

3] Periodontal status to be evaluated by using cpi modified index and scored.

4] Diagnosed cases with periodontal disease should be managed.

5] Regular follow up for diabetic and periodontal condition to be monitored once in 3 months.

6] Awareness program on interrelation between periodontal disease and diabetics to be done in PHC, CHC level.

7] Periodontist to be appointed in general hospitals so that cases from other PHC and CHC can be referred for treatment.

8] General hospital should be rendered good equipment facilities to have good treatment for public.

9] Improving general health of public.

10] Periodontal care for diabetic patients can be included in NOHP.

References

1. World Health Organization, Department of Non-communicable Disease Surveillance. Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications.Geneva:World Health Organization,Department of Non-communicable Disease Surveillance; 1999.
2. World Health Organization Diabetes country profiles, 2016.

3. J A M IacopinoPeriodontitis and diabetes interrelationships: role of inflammation Ann Periodontol 2001 Dec;6(1):125-37
4. Grossi SG, Genco RJ. Periodontal Disease and Diabetes Mellitus: A Two-Way Relationship. Ann Periodontal.1998; 3:51–61.
5. Casanova L, Hughes FJ, Preshaw PM. Diabetes and periodontal disease: A two-way relationship. Br Dent J 2014; 217:433-7.
6. Chávarry NG, Vettore MV, Sansone C, Sheiham A. The relationship between diabetes mellitus and destructive periodontal disease: A meta-analysis. Oral Health Prev Dent 2009; 7:107-27.
7. Nazir: Prevalence of periodontal disease, its associations with systemic diseases and preventionists 2017 Apr-Jun; 11(2): 72–80.
8.]Kaveeshwar SA, Cornwall J. The current state of diabetes mellitus in India. Australis Med J 2014; 7:45-8.

9. Apoorva, Prevalence and severity of periodontal disease in type 2 diabetes mellitus (non–insulin-dependent diabetes mellitus) patients in Bangalore city: An epidemiological studyJournal of Indian Society of Periodontology - Vol 17,1, 2013.

10 Zargar AH, Khan AK, Masoodi SR, Laway BA, Wani AI, Bashir MI, et al. Prevalence of type 2 diabetes mellitus and impaired glucose tolerance in the Kashmir Valley of the Indian subcontinent. Diabetes Res Clin Pract 2000;47: 135-46.

11 Carlos Antonio negrato Periodontal disease and diabetes mellitus J Appl Oral Sci. 2013;21(1):1-12

12 Monika Singh, Vivek Kumar Bains Prevalence of Periodontal Disease in Type 2 Diabetes Mellitus Patients: A Cross-sectional Study Contemporary Clinical Dentistry [2].2019

13 S, Kumar V, Kumar S, Subbappa A. The effect of periodontal therapy on the improvement of glycemic control in patients with type 2 diabetes mellitus: A randomized controlled clinical trial. Int J Diabetes Dev Ctries 2008;28:38-44.

14 Chen-zhou WuEpidemiologic relationship between periodontitis and type 2 diabetes mellitusBMC Oral Health (2020) 20:204

15]Emrich JL, Shlossman M, Genco JR. Periodontal disease in non-insulin dependent diabetes mellitus. J Periodontol 1991;62: 123-31

16] Novaes progression in type 2 non-insulin dependent patients (NIDDM). Part I- Probing pocket depth and clinical attachment. Braz Dent J 1996; 7:65-73.

17] Almas K, Al-Qahtani M, Al-Yami M, Khan N. The Relationship between Periodontal Disease and Blood Glucose Level among Type 2 Diabetic Patients. J Contemp Dent Pract 2001; 4:18-25.