



ISSN NO. 2320-5407

Journal Homepage: -[www.journalijar.com](http://www.journalijar.com)

## INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/9476  
DOI URL: <http://dx.doi.org/10.21474/IJAR01/9476>



INTERNATIONAL JOURNAL OF  
ADVANCED RESEARCH (IJAR)  
ISSN 2320-5407  
Journal Homepage: <http://www.journalijar.com>  
Journal DOI:10.21474/IJAR01

### RESEARCH ARTICLE

#### PERIODONTAL STATUS AMONG TYPE 2 DIABETIC PATIENTS ATTENDING A TEACHING HOSPITAL, KHAMMAM - A CROSS SECTIONAL STUDY.

Dr. Peddiraju Mounika<sup>1</sup>, Dr. T. Madhavi Padma<sup>2</sup>, Dr. K. V. N. R. Pratap<sup>3</sup>, Dr. V. Siva Kalyan<sup>4</sup> and Dr. P. Srikanth<sup>5</sup>.

1. Post graduate, Department of Public health dentistry, Mamata Dental College, Khammam.
2. Professor, Department of Public health dentistry, Mamata Dental College, Khammam.
3. Professor and Head, Department of Public health dentistry, Mamata Dental College, Khammam.
4. Reader, Department of Public health dentistry, Mamata Dental College, Khammam.
5. Senior Lecturer, Department of Public health dentistry, Mamata Dental College, Khammam.

#### Manuscript Info

##### Manuscript History

Received: 03 June 2019  
Final Accepted: 05 July 2019  
Published: August 2019

##### Key words:-

type 2 diabetes mellitus, oral health, periodontitis.

#### Abstract

**Background:** Diabetes mellitus is one of the most serious diseases of metabolism. A number of oral conditions have been associated with diabetes mellitus, particularly in patients with poor glycaemic control. The aim of the study was to assess the periodontal status and to suggest preventive measures among type 2 diabetic patients.

**Material and methods:** A cross sectional study was conducted among type 2 diabetic patients attending teaching hospital, Khammam. Demographic details were collected using a questionnaire and periodontal examination was performed using CPI Loss of attachment. Data analysis was done using descriptive statistics, chi-square test and one way ANOVA.

**Results:** Majority (54.2%) of the study participants are males. CPI scores, 48% had code 2 and 46.5% had code 1 (Loss of attachment of 4-5mm). A statistically significant association was found between glycated haemoglobin level and loss of attachment ( $p=0.017$ ).

**Conclusion:** It was concluded that there is a significant association between diabetes mellitus and periodontal status of the study population. Regular follow up of dental problems and practice of various preventive measures is required.

Copy Right, IJAR, 2019,. All rights reserved.

#### Introduction:-

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia with defective insulin secretion, action, or both. The effects of diabetes mellitus causes long term damage, dysfunction, and failure of various organs. The most common forms of diabetes are termed type 1 and 2.<sup>1</sup>

The diabetes epidemic is rapidly increasing in many countries and it is documented mostly in low- and middle-income countries and was projected to be the seventh leading cause of death in 2030. So the World Health Organization has set specific, effective and affordable actions to tackle diabetes on World health day in the year 2016 with a theme "Halt the Rise Beat Diabetes"<sup>2</sup>

**Corresponding Author:- Peddiraju Mounika.**

Address:- Post graduate, Department of Public health dentistry, Mamata Dental College, Khammam.

According to the report by Indian Council for Medical research in November 2017, diabetes prevalence has increased by 64% across India<sup>3</sup> and because of its highest prevalence India is predicted to become “Diabetic Capital of the world”.<sup>4</sup>

Studies indicated that diabetic patients are two to three times more likely to develop periodontal disease and the severity is related to long term metabolic control of diabetes, and not the duration of diabetes.<sup>5</sup> Periodontitis has been referred to as sixth complication of diabetes.<sup>1</sup> As there were no studies performed among type 2 diabetics in Khammam town and also there is a paucity of data regarding the severity of periodontal disease, the present study was conducted to assess periodontal status and to suggest preventive measures in this population.

### **Material and methods:-**

A cross-sectional study was conducted on type 2 diabetic patients attending Mamata Institutions, Khammam. Data collection was started after obtaining ethical clearance from the ethical committee of the institution. The study was conducted for a period of 6 months (February 2018 to July 2018).

The study instrument consisted of demographic data, personal habits and blood investigations and periodontal assessment was done using CPI Loss of attachment.

A pilot study was undertaken by a single examiner and a recording assistant among 40 type 2 diabetic patients attending Mamata Institutions, for the estimation of the final sample size and to check the feasibility of the survey procedure. The final sample size was 350. Type 2 diabetic patients attending teaching hospital for their treatment are taken into the study until the required sample size is reached.

All the subjects were provided with a patient information sheet explaining the survey procedure and written informed consent was obtained from them before the examination.

Data were entered and analyzed using IBM SPSS software. Descriptive statistics, Chi-square test, ANOVA and Turkey's post hoc analysis were used.

### **Results:-**

Table 1 represents the study population of 350 type 2 diabetic patients attending Mamata Institutions where 54.2% were males. 31.4% of the study participants were in the age group of 51-60 years, and 49.7% were diabetic since 5 years.

Table 2 represents 55.1% had fasting blood sugar level <150mg/dl, and 49% of the study participants had a glycosylated hemoglobin level of more than 8% (poor control).

Table 3 shows that smoking and alcohol habits were present among study participants for more than 10 years.

Table 4 represents CPI scores among the study participants, where majority (48%) of them have code 2, and 0.86% had code 1.

Table 5 represents the study participants scored for loss of attachment, where 46% of the participants had score 1(4-5mm) and 12.5% of the study participants had score 2(6-8mm).

Table 6 represents association between duration of diabetes, HbA1c level and loss of attachment. It was found when the duration of diabetes is less than 5 years 56.6% of the study participants had a loss of attachment of 0-3 mm which was not statistically significant ( $p=0.13$ ).

Table 7 represents when the HbA1c level was between 6-7 % the loss of attachment of 4-5mm(Code 2) was 56.5% and was found to be statistically significant( $p=0.01$ ).

### Discussion:-

A cross-sectional epidemiological study was conducted to assess oral health status and treatment needs on 350 type 2 diabetic patients attending an outpatient block of Mamata Institutions, Khammam.

The present study shows 54.2% of the study participants were males. This finding shows that males are more affected with type 2 diabetes and this may be due to different perceptions of health, health behavior and lifestyle factors. Similar results were found in a study conducted by Ashish Aggarwal et al.<sup>6</sup>

In the present study, where 46.5% of the participants had loss of attachment of score 1(4-5mm) and similar results were found in a study conducted by Chandu G.N et al.<sup>7</sup>

In the present study, there was no association between duration of diabetes and loss of attachment. The results of the present study are in accordance with the study by Pathak et al.<sup>8</sup> These findings indicate that periodontal disease increases with age and it is also assumed that more severe forms of periodontal disease is seen in diabetic patients.

Concerning the association between glycosylated hemoglobin and loss of attachment, it was observed that with poor glycaemic control there was an increase in loss of attachment which was found to be statistically significant ( $p=0.01$ ). The results are in accordance with the study conducted by S.M Apoorva et al<sup>9</sup> and this association can be hypothesized by the formation of advanced glycation end products. The other probable mechanism is that both impaired blood glucose and periodontal disease have common risk factors such as stress and smoking.<sup>10</sup>

It is recommended that diabetologists must educate people to improve the general health and also oral health in particular by coordinating with oral health care professionals to maintain oral health through prompt, timely oral health care, effective health education with special importance on preventive practices to improve the dental health as it is most commonly affected.

### Conclusion:-

From the results of the present study, it was concluded that there was a significant association between periodontal health and type 2 diabetes mellitus. Hence more emphasis should be given for health education and preventive measures to improve oral health must be practiced.

**Table 1:-**Distribution of participants according to age, gender and duration of Diabetes

Characteristics	n	%
<b>Age groups</b>		
<=40yrs	47	13.43
41-50yrs	91	26.00
51-60yrs	110	31.43
61-70yrs	102	29.14
<b>Gender</b>		
Male	190	54.29
Female	160	45.71
<b>Duration of diabetes</b>		
<5years	174	49.71
6-10 years	114	32.57
>10 years	62	17.71

**Table 2:-**Distribution of study participants according to Fasting blood sugar levels and HbA1c Level

FBS	n	%
<150 mg/dl	193	55.14
151-200 mg/dl	73	20.86
>200mg/dl	84	24.00
<b>HbA1c</b>		
6-7%	99	28.29
7-8%	79	22.57

>8%	172	49.14
-----	-----	-------

**Table 3:-**Distribution of study participants according to duration of Smoking and Alcohol

Duration	Smoking		Alcohol	
	n	%	n	%
<5years	0	0.00	2	0.57
6-10 years	5	1.43	2	0.57
> 10years	15	4.29	59	16.86

**Table 4:-**Distribution of study participants according to CPI Scores

CPI Score	n	%
Code 1	3	0.86
Code 2	168	48.00
Code 3	149	42.57
Code 4	30	8.57

**Table 5:-**Distribution of study participants according to Loss of attachment (LOA)

LOA	n	%
Score 0 (0-3mm)	143	40.86
Score 1(4-5 mm)	163	46.57
Score 2 (6-8mm)	44	12.57

**Table 6:-**Association between Loss of attachment and HbA1c level

HbA1c	0-3mm(Code 0)		4-5mm(Code 1)		6-8mm(Code 2)		Total (N)
	n	%	n	%	n	%	
6-7%	35	35.35	56	56.57	8	8.08	99
7-8%	40	50.63	33	41.77	6	7.59	79
>8%	68	39.53	74	43.02	30	17.44	172
<b>Total</b>	143	40.86	163	46.57	44	12.57	350

Chi-square=12.0244      p=0.0171\*

**Table 7:-**Association between Loss of Attachment and Duration of diabetes

LOA	<5years(n)	%	5-10 years(n)	%	>10 years(n)	%	Total(N)
Code 0 (0-3mm)	81	<b>56.64</b>	42	29.37	20	13.99	143
Code 1 (4-5mm)	76	46.63	57	<b>34.97</b>	30	18.40	163
Code 2 (6-8mm)	17	38.64	15	34.09	12	<b>27.27</b>	44
<b>Total</b>	174	49.71	114	32.57	62	17.71	350

Chi-square=6.9844      p=0.1367

**References:-**

1. Kaur S, Kaur K, Rai S, Khajuria R. Oral health management considerations in patients with diabetes mellitus. Archives of Medicine and Health Sciences. 2015 Jan 1;3(1):72.
2. Diabetes. Available at [www.who.int](http://www.who.int) > News > Fact sheets > Detail. Accessed on 25/7/2018.
3. Diabetes is India's fastest growing disease: 72 million cases recorded in 2017, figure expected to nearly double by 2025. Available at <https://www.firstpost.com> > India News. Accessed on 1/9/2018.
4. InderjitMurugendrappa Gowdar1 , Mohammed Almuhaiza2 Diabetes and Oral Health – A Review Annals of International Medical and Dental Research,2016 Vol (2), Issue (2):2-8

5. Kamath DG, Nayak SU, Pai KK, Shenoy R. Knowledge and awareness of oral health among diabetic patients—a cross-sectional study from Mangalore City. *International Journal of Diabetes in Developing Countries*. 2015 Jun 1;35(2):71-5.
6. Aggarwal A, Panat SR. Oral health behavior and HbA1c in Indian adults with type 2 diabetes. *Journal of oral science*. 2012;54(4):293-301.
7. Chandu GN, Prashant GM, Shivakumar KM, Thippeswamy HM, Sunitha S, Chandrashekhar S, Alur M. Prevalence of Dental Caries and Periodontal Status Among Diabetic Patients of Davangere City, Karnataka, India. *Journal of Indian Association of Public Health Dentistry*. 2007 Jan 1;5(9):33.
8. Pathak AK, Shakya VK, Chandra A, Goel K. Association between diabetes mellitus and periodontal status in north Indian adults. *European Journal of General Dentistry*. 2013 Jan 1;2(1):58.
9. Apoorva SM, Sridhar N, Suchetha A. Prevalence and severity of periodontal disease in type 2 diabetes mellitus (non-insulin-dependent diabetes mellitus) patients in Bangalore city: An epidemiological study. *Journal of Indian Society of Periodontology*. 2013 Jan;17(1):25.
10. Morita I, Inagaki K, Nakamura F, Noguchi T, Matsubara T, Yoshii S, Nakagaki H, Mizuno K, Sheiham A, Sabbah W. Relationship between periodontal status and levels of glycated hemoglobin. *Journal of dental research*. 2012 Feb;91(2):161-6.