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Prevalence of the periodontal disease and tooth loss in patients suffered from diabetes

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Abstract
Diabetes is linked to tooth loss primarily because people with diabetes are more susceptible to periodontal disease. Periodontal diseases are infections, inflammations, and loss of tissue in the gums and other tooth-supporting structures such as bone. Hence based on the literature findings of the prevalence of tooth loss in diabetic patients the current observational study was planned. The aim of the present study is to find out the demographic details of and number of missing tooth's in the diabetic patients.
The current retrospective study was planned in Anugrah Narayan Magadh Medical College and Hospital on total 100 patients were enrolled in the present study. The 50 patients were divided in the patients suffered from diabetes and 50 patients were considered in the normal group as control cases.
It can be concluded from the findings of the present study that there is significant difference in teeth loss amongst diabetics and non-diabetics. Hence care should be taken the by diabetic patients for the dental problems by regular visits to the Dentist.

Keywords: diabetes, periodontal disease, tooth loss

Introduction
Periodontal disease, also known as gum disease, is a set of inflammatory conditions affecting the tissues surrounding the teeth. In its early stage, called gingivitis, the gums become swollen, red, and may bleed. In its more serious form, called periodontitis, the gums can pull away from the tooth, bone can be lost, and the teeth may loosen or fall out. Bad breath may also occur [1].
Periodontal disease is generally due to bacteria in the mouth infecting the tissue around the teeth [3]. Risk factors include smoking, diabetes, HIV/AIDS, family history, and certain medications [1]. Diagnosis is by inspecting the gum tissue around the teeth both visually and with a probe and X-rays looking for bone loss around the teeth [2].
Treatment involves good oral hygiene and regular professional teeth cleaning. Recommended oral hygiene include daily brushing and flossing. In certain cases antibiotics or dental surgery may be recommended. Globally 538 million people were estimated to be affected in 2015. In the United States nearly half of those over the age of 30 are affected to some degree, and about 70% of those over 65 have the condition. Males are affected more often than females [3].
Periodontitis has been linked to increased inflammation in the body, such as indicated by raised levels of C-reactive protein and interleukin-6. It is associated with an increased risk of stroke, myocardial infarction, atherosclerosis and hypertension. It also linked in those over 60 years of age to impairments in delayed memory and calculation abilities. Individuals with impaired fasting glucose and diabetes mellitus have higher degrees of periodontal inflammation, and often have difficulties with balancing their blood glucose level owing to the constant systemic inflammatory state, caused by the periodontal inflammation. Although no causal association was proven, a 2009 study showed correlation between chronic periodontitis and erectile dysfunction [4].
The primary cause of gingivitis is poor or ineffective oral hygiene, which leads to the accumulation of a mycoticand bacterial matrix at the gum line, called dental plaque. Other contributors are poor nutrition and underlying medical issues such as diabetes. Diabetics must be meticulous with their homecare to control periodontal disease. New finger prick tests have been approved by the Food and Drug Administration in the US, and are being used in dental offices to identify and screen patients for possible contributory causes of gum disease, such as diabetes [5].
Diabetes appears to exacerbates the onset, progression, and severity of periodontitis. Although the majority of research has focused on type 2 diabetes, type 1 diabetes appears to have an identical effect on the risk for periodontitis. The extent of the increased risk of periodontitis is dependent on the level of glycaemic control. Therefore, in well managed diabetes there seems to be a small effect of diabetes on the risk for periodontitis. However, the risk increases exponentially as glycaemic control worsens. Overall, the increased risk of periodontitis in diabetics is estimated to be between 2-3 times higher. So far, the mechanisms underlying the link are not fully understood, but it's known to involve aspects of inflammation, immune functioning, neutrophil activity, and cytokine biology [6].
If you are diabetic, you know that high blood sugar levels put you at risk for problems with your kidneys, eyes and heart. In addition, diabetes causes your healing process to be slower and compromises your resistance to infections; this increases your susceptibility to developing periodontal disease. These

two factors make treating periodontal disease in diabetic patients more difficult and accounts for why gum disease in diabetics may be more severe.

Diabetes is linked to tooth loss primarily because people with diabetes are more susceptible to periodontal disease. Periodontal diseases are infections, inflammations, and loss of tissue in the gums and other tooth-supporting structures such as bone.

Individuals with diabetes, especially those who have poor glucose control, have a blunted defence mechanism against infections. Minor infections in the mouth, therefore, can linger on or worsen, causing chronic inflammation and erosions. Along with poor glucose control, smoking and alcohol use also cause and aggravate periodontal disease. And this isn't just a problem in adults with diabetes. Diabetic children, too, often have extensive periodontal disease by the time they reach adolescence [7].

Hence based on the literature findings of the prevalence of tooth loss in diabetic patients the current observational study was planned. The aim of the present study is to find out the demographic details of and number of missing tooth's in the diabetic patients.

Methodology

The current retrospective study was planned in Anugrah Narayan Magadh Medical College and Hospital on total 100 patients were enrolled in the present study. The 50 patients were divided in the patients suffered from diabetes and 50 patients were considered in the normal group as control cases.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study:

Inclusion Criteria

- Patients above 20 years of age and suffered from diabetes

Exclusion Criteria

- Patients suffered from hypertension, kidney diseases and other chronic diseases

Results & Discussion

This is the hospital based observation study in the Department of Dentistry. The data from the two groups of patients were collected and presented as below.

Table 1: Comparison of Clinical Findings

Group	Group A	Group B
Cases of	**Diabetic Patients**	**Control Patients**
Total No,. of Cases	50	50
Males	25	29
Females	15	11
Age Group:		
25 -35 years	7	5
35 – 45 years	15	21
45 – 55 years	18	16
Above 55 years	10	8

Table 2: Periodontal status

Group	Group A	Group B
Cases of	**Diabetic Patients**	**Control Patients**
Total No. of Cases	50	50
Presence of painful Gums	36	16
Presence of Gingival swelling	32	12
Extraction of teeth because of periodontal reasons	11	5

Table 3: No. of missing Tooth's

Group	Group A	Group B
Cases of	**Diabetic Patients**	**Control Patients**
Total No. of Cases	50	50
No. of Missing Tooth		
25 -35 years	2 – 3	1 – 2
35 – 45 years	3 – 5	2 - 3
45 – 55 years	4 – 8	3 - 4
Above 55 years	8 – 11	4 - 6

India leads the world today with the largest number of diabetics in any given country. In the 1970s, the prevalence of diabetes mellitus 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 million 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 mellitus Capital of The World".

Diabetes mellitus is recognized as an important risk factor for more severe and progressive periodontitis, infection or lesions resulting in the destruction of tissues and supporting bone that form the attachment around the tooth. Periodontal disease has been reported as the sixth complication of diabetes mellitus, along with neuropathy, nephropathy, retinopathy, and micro- and macro vascular diseases [8].

Diabetes is one of the important risk factors for periodontal disease. Diabetic patients get their teeth extracted due to periodontal problems. In a study conducted by Ogunbodede *et al*. [9] the female: male ratio was positive, indicating more number of females are involved as compared to males. Ina similar study conducted by Chinenye *et al*. [10], the male to female ratio of diabetic subjects in their study was 2:1. Butin

various other studies, the male to female ratio was 1:1. [11].

As per the WHO criteria, if fasting blood glucose is between100 mg/ dl-125 mg/dl, it is regarded as pre diabetic stage. If it is above 126 mg/dl is diabetes mellitus. A post prandial blood glucose levels below 140 mg/dl is considered normal. Levels above 200 mg/dl is indicative of type 2 diabetes mellitus. In a study conducted by Ochao *et al*, at Columbia there were 47.4% diabetic subjects who had increased number of missing teeth and suffered from gingival disease in the past.20 As per the World Health organization, teeth extraction below the age of 34 is generally due to caries and extractions above the age of 34 are mostly due to periodontal reasons [12].

Few studies discusses the relationship between periodontitis and type 2 diabetes mellitus, focusing on the mechanisms through which periodontal infections contribute to the diabetes mellitus-related inflammatory state, the influence of periodontal infections on insulin resistance and the ways in which treatment of these infections can influence glycemic control [13].

The reason for the greater occurrence of periodontal destruction in diabetics is not clear. However, studies of the periodontal flora find similar microorganisms in diabetic and non-diabetic people, suggesting that alteration in host responses to periodontal pathogens account for these differences in periodontal destruction. For example, increased susceptibility to infection by periodontal bacteria associated with altered phagocyte functions and reduced healing capacity associated with altered collagen metabolism may explain, in part, the increased levels of periodontal disease in diabetic patients. The response to treatment suggests that the periodontal lesions are eminently treatable and that eradication of the infection and the inflammatory foci may reduce insulin requirements. The knowledge among people with diabetes mellitus of oral co-morbidity is generally poor and suggests the need for appropriate health education and health promotion to improve the oral health of diabetic patients [14].

Conclusion

It can be concluded from the findings of the present study that there is significant difference in teeth loss amongst diabetics and non-diabetics. Hence care should be taken the by diabetic patients for the dental problems by regular visits to the Dentist.

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