



# PROSTHODONTIC MANAGEMENT OF PATIENTS WITH DIABETES MELLITUS

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## ABSTRACT

Diabetes Mellitus is a nutritional metabolic disorder characterize by various oral and systemic problems. Diabetes affects most part of body and oral cavity. These patients when referred to dentist or prosthodontist for the provision of prosthetic treatment require multidisciplinary approach. Prosthodontic care of a diabetic patient mandates the specialists to be familiar with the concealed facts about the metabolic disorder.

**Keywords :-**Diabetes Mellitus, Prosthodontic Management, Insulin.

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## INTRODUCTION

Diabetes Mellitus is a clinical syndrome characterized by hyperglycemia due to absolute or relative deficiency of insulin. The two main categories of Diabetes Mellitus include Type I or Insulin Dependent Diabetes Mellitus and Type II or Non-insulin dependent Diabetes Mellitus. The former is a result of absolute deficiency of insulin with its onset occurring before adulthood. In contrast, Type II results because of insulin resistance with an insulin secretory defect with its onset usually occurring in mid or later life although it can occur earlier as well [1]. Diabetes mellitus is a disease of glucose, fat & protein metabolism resulting from impaired insulin secretion, varying degree of insulin resistance or both. Hyperglycemia is the most clinically important metabolic aberration in diabetes mellitus & the basis for its diagnosis. Apart from the obvious impact of impaired glucose metabolism, diabetes mellitus & chronic hyperglycemia are associated with important ophthalmic renal, cardiovascular, Cerebrovascular

& peripheral neurological disorders [2]. Management of the diabetic dental patient must take into consideration the impacts of diabetes on dental disease & dental treatment, as well as a clear appreciation for the co morbidities that accompany long standing diabetes mellitus.

### Oral manifestations of diabetes

1. Oral conditions include burning mouth, altered wound healing, and increased incidence of infection. Enlargement of the parotid glands and xerostomia.
2. Neuropathy and Diabetes is a risk factor for the prevalence and severity of gingivitis and periodontitis.
3. Risk of attachment loss and alveolar bone loss approximately 3 folds when compared to non diabetic control subjects.
4. Enlarged gingival tissues, multiple periodontal abscesses,

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Changes in the function of host defense cells.

5. Changes in the collagen metabolism, wound healing alternations and periodontal destruction.

### Diagnosis

The diagnosis of diabetes is based on the classic symptoms like polyuria, polydipsia, polyphagia, weight loss and visual disturbances.

According to American diabetic association (ADA): Fasting blood sugar (FBS) > 126mg/dl or Post random blood sugar (PRBS) >200mg/dl and HBA1C  $\geq$ 6.5%

In the absence of these classic symptoms glucose intolerance may exist as impaired fasting glucose (IFG) when FBS is between 100 - 125 mg/dl. Similarly, plasma glucose of 140 – 199 mg/dl called as impaired glucose tolerance (IGT). This distinction is important because individuals with IFG & GT are at increased risk of developing atherosclerotic disease even though if they don't develop diabetes. Type I diabetes often presents with markedly elevated plasma glucose & associated symptoms, whereas type II is often not diagnosed until complications occur. Therefore, screening test is important in type II diabetes. ADA recommends FBS screen individuals above 45 years every 3 years, in case of obese. Screening should also have considered at younger age in individuals with overweight (BMI > 25) and who have hypertension or any vascular disease.

### Management Considerations: General Dental Considerations

It is better to arrange appointment in the morning and avoiding lengthy appointments. All procedures should be done involving minimal possible trauma and should be carried in stress free environment. Maintenance of good oral hygiene is a prerequisite for all dental procedures. In this regard application of topical agents like chlorhexidine, fluoride gel is found very useful. The use of prophylactic medication to avoid postoperative infection and pain is recommended in certain cases. For management of xerostomia, diet counseling, medication, artificial salivary substitutes are helpful. Before starting any procedure consultation with patient's physician or endocrinologist is also beneficial for the diabetic patients [3].

Dentist should also be able to know about the diagnosis and management of hypoglycemic shock. It is characterized by hunger, nausea, perspiration, pallor, and tachycardia. In severe condition seizure may occur and patient may undergo in state of unconsciousness

Management depends upon the severity of the shock. Initially treatment should be deferred and to monitor vital signs and administer glucose orally if possible otherwise intravenous administration of glucose should be done.

### Prosthodontics Management Considerations:

Eradication of any disease that will affect the prognosis of any dental prosthesis will be the first line of action. Teeth requiring restoration must be restored by appropriate restorative procedures like filling, endodontic treatment etc. As previously mentioned restoration and the maintenance of good oral hygiene is mandatory before starting any prosthodontic procedures. On first visit, assessment of the patient should be done which include proper history and examination. Details regarding type of prosthesis, duration of treatment, number of appointments must be explained to the patient [4].

Radiographic evaluation must be carried out. Patients is advised to bring reports of recently done and up to date laboratory investigation regarding blood sugar level. Secondly it is better to note blood sugar level before starting any dental procedure with the help of glucometer. Patient must be instructed to consult his or her physician before initiating any procedure, if needed then any alteration regarding patient's medication must be discussed with the patient's physician [5].

If patient is provided removable partial denture (RPD), then restoration and maintenance of good oral hygiene by any restorative procedures or root planning and scaling must be accomplished first. Health of abutment teeth is very important and will be achieved by various means for better prognosis of RPD treatment. All components of RPD must be tissue friendly by making appropriate design of the prosthesis. As diabetic patients are more prone to develop periodontal diseases, therefore in certain cases splinting of periodontally compromised teeth is also a good option. Sometimes periodontal surgery may be indicated. Selection of particular type of RPD is also very important, in Diabetic patients. If an acrylic denture is a preferred option then the design should incorporate the principles of 'Every Denture' with wider self cleansing interdental spaces and embrasures areas, uncovered marginal gingiva, point contact between denture and natural abutment teeth, free gliding occlusion, maximum retention following complete denture making principles. These all factors are beneficial for the diabetic patients if they need RPD.

When complete denture is fabricated for diabetic patients then always use tissue friendly material and technique, impression making will be done by mucostatic technique. Occlusal vertical dimension should be appropriate

Always use an occlusal scheme that has narrow bucco-lingual dimension and shortened mesiodistal length. This approach will decrease the stress on the underlying tissue to retard bone resorption, concept of neutral zone can also be employed. Denture flanges should be smooth and polished. There should be no working or non-working occlusal interference between opposing teeth.

It is also mandatory for the dentist to fully educate and motivate the patient to the importance of maintaining good

oral hygiene and towards the importance of regular follow-up visits to the dentist.

This will ensure the long term health of the oral tissues by preventing chronic infection states such as denture related stomatitis and denture hyperplasia that could lead to more serious conditions. Diabetic patients are more susceptible to infections which in severe cases may lead to excessive oral tissue destructions, such patients may need obturators. Fabrication of obturator require special care in every patient and especially in diabetic patient [6].

For patients requiring a fixed prosthesis like crown or fixed partial denture (FPD), the finish-line of the preparation should be placed supragingival and to provide chamfer finish-line on the facial aspect of prepared tooth as it is better than shoulder because shoulder can concentrate stresses on weakened tooth/ teeth. Ante's law should be obeyed; minimal preparation like three quarter crowns can be done on teeth like pre-molar.

A narrow occlusal table, group function or mutually protected occlusal scheme is better choice for periodontally compromised teeth. In certain cases procedures like crown lengthening, periodontal surgery and orthodontic extrusion of tooth will further improve the quality of fixed prosthesis in diabetic patients. Implant supported prosthesis are not advised for patients whose blood sugar level remains uncontrollable but if conditions are favorable, then this type

of prosthesis can be planned. Like any other dental surgical procedure, implant placement must be accomplished with least trauma under stress free environment [7].

Proper medication must be provided before and after implant placement. Complete history and examination along with radiographic evaluation must be carried out for selection of type of dental implant, number of dental implants, site of implant placement, type of artificial prosthesis and occlusal scheme. All these considerations will ensure better performance of implants supported prosthesis.

## CONCLUSION

The alarming condition of diabetes mellitus must be identified during the first appointment with the patient. The metabolic disorder is so complex and demanding that proper education becomes an important and integral part of diabetes treatment. Providing safe and effective prosthodontic care for patients with diabetes requires an understanding of the disease and familiarity with its clinical manifestations. The goal of any prosthodontic therapy must be, to preserve the hard and soft tissues that are remaining rather than replacement of the lost part. The maintenance of proper oral hygiene and regular use of antiseptic mouth rinses must be emphasized. Any diabetic patient undergoing prosthodontic treatment must be recalled on regular basis to assess oral health.

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