



Review Article

Prosthodontic Concerns in a Diabetic Patient

Bushra Rahman

Junior Resident OMFS, Government Dental College & Hospital, Srinagar, J&K

Correspondence Email: drbusharahman@gmail.com

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ABSTRACT

Diabetes Mellitus is a pandemic metabolic disease prevailing globally and is characterized by chronic hyperglycemia due to absolute or relative deficiency of insulin. It affects most parts of human body including the oral cavity. Prosthodontic care of a patient suffering from diabetes demands the specialist to have thorough understanding of the concealed facts about the metabolic disorder. The aim of this review article is to enlighten the adverse effect of diabetes mellitus and its effect on prosthodontic concern.

Key words: Diabetes Mellitus, Hyperglycemia, Prosthodontic management

INTRODUCTION

Diabetes Mellitus is a clinical syndrome characterized by hyperglycemia due to absolute or relative deficiency of insulin. ^[1] This results in disturbances in carbohydrate, fat and protein metabolism due to insulin secretion, insulin action or both. Several pathogenetic processes are involved in the development of diabetes. These include processes which destroy the beta cells of the pancreas with consequent insulin deficiency, and others that result in resistance to insulin action. Contributing factors include genetics, obesity, physical inactivity and advancing age. Diabetes affects most parts of the human body and oral cavity is no exception for the same. A Prosthodontist handle patients of all ages has to realize that this well established metabolic disorder can have a considerable impact on

the final outcome of the prosthodontic management. ^[2]

Prosthodontic concerns in a diabetic patient

Saliva plays an imperative role in the retention of removable prosthetics and the maintenance of oral micro biota equilibrium is well recognized and cannot be overlooked. ^[3] Diabetes Mellitus is well known to alter qualitatively and quantitatively the parenchyma of major salivary glands leading to *hypo salivation*. It is suggested that substitution of normal glandular tissue by adipose tissue decreases saliva production and burning mouth symptoms.

Hypo salivation is normally associated with augmentation of fungi such as *Candida albicans* and other species leading to increased chance of oral infections. The increased concentration of

glucose facilitates greater adherence of fungi to the epithelial cells and interferes with the defense mechanism of polymorphic neutrophils. The manifestations of *oral candidiasis* may occur in different forms such as median rhomboid glossitis, atrophic glossitis, denture stomatitis and angular cheilitis. [4]

Association of diabetes and dentures is well known, and both tend to magnify the incidence of oral candidiasis. Proliferation of fungi can be induced by wearing complete dentures, especially in the palatine mucosa. The association of decreased local vascular circulation due to compression of the prosthesis with poor oral hygiene habits must also be concerned in such patients. Such proliferative lesions associated with dentures are related to the poor conditions of the prosthesis, and to the long time of usage associated with modifications of the hard supporting tissues. [5] Apart from the incidence of oral candidiasis, diabetic patients also have increased chance of other oral lesions like, lichen planus, leukoplakia or erythroplakia. [4]

Most complete denture diabetic patients report an *altered taste sensation* and other neurosensory disorders like *burning mouth syndrome*, dysphagia, etc. [6] The causes for the complex symptom are due the variations in the salivary flow, changes in the buffering capacity of saliva and peripheral neuropathy. The presence of retinopathy and neuropathy severely limit the patient's hands in the maintenance of oral and denture hygiene.

Oral mucous membrane *loses its resilience* because of xerostomia indirectly affecting the retention of complete denture. Resiliency of soft tissues is an essential factor for good adaptation of the denture. [7]

Poor glycaemic condition, xerostomia, reduced buffering action of saliva and early onset of diabetes may

increase the risk of *dental caries* in diabetic patients. The carious condition limits the usage of that particular tooth as an abutment for fixed prosthesis and for overdenture constructions.

Delayed or Impaired wound healing occurs in diabetic patients as a result of poor blood supply to the tissues, reduced oxygen to the cells, microvascular angiopathic changes, reduction of collagen production, increased collagenase activity. [8] Any surgical procedure planned like pre-prosthetic surgery or dental implant placement should be performed only when normal glycaemic levels are achieved.

Periodontitis is often considered as sixth complication of diabetes. [9] Periodontitis is more prevalent and severe in patients with diabetes than in normal population. The function of cells involved in this inflammatory response, including neutrophils, monocytes and macrophages, is altered in many people with diabetes. The adherence, chemotaxis and phagocytosis of neutrophils often are impaired. These cells are the first line of host defense, and inhibition of their function may prevent destruction of bacteria in the periodontal pocket, thereby increasing periodontal destruction. Other immunoinflammatory responses are upregulated in people with diabetes. For example, macrophages and monocytes often exhibit elevated production of proinflammatory cytokines and mediators such as tumor necrosis factor α (TNF- α) in response to periodontal pathogens, which may increase host tissue destruction. Elevated TNF- α level are found in the blood and gingival crevicular fluid, suggesting both a local and systemic hyper responsiveness of this immune cell line. Glycemic control may be an important determinant of this response.

Compromised periodontal condition restrains the tooth from serving as an abutment for fixed prosthesis. Patients who

had lost their teeth because of poor periodontal health report an increased level of residual ridge resorption. Factors like decreased blood supply to the tissues because of microvascular angiopathy increase the amount of residual ridge resorption. Thus construction of complete denture (diabetic patients) in highly resorbed ridges becomes challenging for a Prosthodontist.

Prosthodontic therapy with implants is an attractive substitute to traditional fixed/removable prosthetic appliances. [10] Various studies are done on the influence of diabetes on osteointegration and success of implant treatment. [11] Diabetes mellitus is not an absolute contraindication for implant prosthesis. Several criteria like systemic glycaemic level, glycaemic control on bone, periodontal condition are considered for diabetic patients. The threats of poor wound healing, impaired osseointegration, increased chance of infection and periodontitis interfere with successful implant therapy. Proper patient selection with well controlled glycaemic level and adequate antibiotic administration improves survival of dental implants in patients with diabetes.

CONCLUSION

The ultimate goal of prosthodontic therapy for diabetic patients requires thorough understanding of the disease and acquaintance with its clinical manifestations. The metabolic disease must be identified at first appointment with the patient. Prosthodontic therapy should aim to preserve the hard and soft tissues that are remaining rather than replacement of lost tissues. 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 the oral health. With an increasing incidence and prevalence of diabetes, the role of oral

health care provider becomes very important.

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