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DIABETES MELLITUS AND PROSTHODONTIC CARE

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Abstract:

The aim of the review to bring out the prosthodontic care in diabetes mellitus patients.the objective of the review is to bring out the adverse effect of diabetes mellitus and its effect on prosthodontic treatment and the management.Diabetes mellitus type 2 is a pandemic disease which is prevailing globally. It is usually caused due to deficiency or absolute absence of insulin. It affects many part of the body including oral cavity. It is characterised by chronic hyperglycaemia. Contributing factors include genetics, obesity, physical inactivity and advancing age. Diabetes affects most parts of the human body, also oral cavity is no exception for the same. The purpose of this review is to bring out the ultimate prosthodontic treatment options for patients with diabetes mellitus with better care and to maintain proper oral hygiene.

Introduction:

Diabetes is a systemic condition where there is lack of insulin production in the body or insulin that is produced is no longer as effective at cellular level. It is a syndrome not only affects the metabolism of carbohydrates, protein and glucose, also under chronic situation causes long term damage to various organs such as heart, eyes, kidneys, nerves & vascular system.

Classification:

Type 1 - Beta cell destruction which in turn may result in total absence of insulin or deficiency of insulin. It is also called insulin dependent diabetes mellitus.[6] It is mostly commonly occur in childhood and adolescence of any group of age.

Type 2 - beta cell dysfunction or insulin resistance.It is also called non- insulin dependent diabetes mellitus.[7] It seen in patients with increase in age, obesity & lack of physical activity.

Diabetes is characterized by a complex clinical manifestation such as: nephropathy, retinopathy, neuropathy and cardiovascular diseases. In patients with diabetes numerous oral complications are present, they are

Oral Complications of Diabetes Mellitus:

- ✓ Xerostomia
- ✓ Gingival Inflammation
- ✓ Increased Caries Risk
- ✓ Burning Sensation
- ✓ Periodontitis
- ✓ Fungal Infections
- ✓ Poor Wound Healing
- ✓ Alveolar Bone Resorption

Xerostomia:

Xerostomia is condition of dry mouth. Patients with diabetes has polyurial action which means increased excretion of water lead to dehydration ,increasing the sensation of dry mouth and causing xerostomia. Secondly**,** Peripheral nervous system disfunction caused by diabetes (autonomous peripheral neuropathy) can cause damage to the salivary glands and decrease of salivary flow**.** As a result, there is increase in stomatitis and candidal infections in the oral cavity. Patients using removable dentures should be informed about oral care as well as about maintenance of the dental prostheses and the need to renew them.

Poor Wound Healing:

In diabetes there is a pronounced imbalance of pro-/anti-inflammatory cytokines leading to impaired tissue repair and weakened cellular and humoral immune defense mechanisms. Poor wound healing in diabetes mellitus patients may be due to insufficient nerve-derived mediators i.e., neuropeptides such as substance P may contribute to the impaired response to injury.[8] Decreased collagen formation may also leads to poor wound healing because clotting involves collagen fibres.Impaired growth factor secretion may also be a key mechanism for impaired wound healing in diabetics.[2]

Gingival Inflammation:

Gingival inflammation is one of the major complications for diabetes mellitus. Worsening of glycemic level or increased glucose level in blood lead to poor metabolism which may lead to gingival inflammation.

Increased Risk of Fungal Infection:

Fungal infections like candidiasis is associated with poor glycemic control and use of denture. It is due to Change in pH, increased salivary glucose levels and immune dysregulation in diabetic patients.

Burning Sensation:

In diabetes, burning mouth syndrome, which develops due to peripheral neuropathy, causes xerostomia, candidiasis and taste disturbance in the mouth. These adversely affect the patient's food intake and create a negative effect on metabolic control of diabetes.

Increased Caries Risk:

Patients with diabetes mellitus have increased risk of caries and periodontal problems. As there is change in the oral environment due to decreased salivary flow and pH and increased pathogenic bacterial growth in the mouth causes damage to the hard and soft tissue of the teeth.

Prosthodontic Care in Diabetes Mellitus:

The restoration and the maintenance of good oral hygiene is mandatory before starting any prosthodontic procedures.

- ✓ **Medical History:** It is important to take proper medical history of the patient's Blood glucose levels, Medication, dosage and timing of medication taken. Make sure the patient had donetheir blood glucose level test prior to the treatment.HbA1C is evaluated to check overall glycemic control for a period of 3 months.It is very important to evaluate proper medical history and assess glucose level at the initial appointments in all the patients older than 45 years of age.
- ✓ **Diet:** It should be ensured that patient has had his/her breakfast and medication before treatment.
- ✓ **Scheduling of the Patient's Visit:** Diabetic patients should be scheduled preferably in the morning. Since endogenous cortisol level is higher during morning time which in turn increases blood glucose level
- ✓ **In RPD:** All components of RPD must be designed appropriately such that prosthesis is tissue friendly. Proper oral hygiene and denture hygiene or maintenance instructions should be given to the patients.
- ✓ **In CD:** Denture border and tissue surfaces of the dentures should be smooth without any sharp nodules or over extensions to prevent tissue damage.Impressions should be taken in mucostatic technique without pressure. Concept of neutal zone technique can be employed to reduce the bone resorption .Proper oral hygiene instructions can be given to patients to avoid fungal infections.As there is decrease denture retentiondue to less salivation, frequent sipping of water and use of sugarless gums may help them to maintain salivary flow.
- ✓ **In FPD:** It is better to keep the finish line supragingival to avoid damaging soft tissue. The chamfer margin is a better option as it applies less force or stress on weakened tooth.Ante's law should be obeyed as the diabetic patient more prone for periodontal infection.Proper flossing should be done to maintain the oral hygiene. During tooth preparation, care should be taken to avoid trauma to the soft tissue as diabetes patients have poor wound healing. Hygienic pontic should be preferred as much as possible for ease of cleansing action.
- ✓ **In Implant or Implant Supported Dentures:** Implant supported prosthesis are not indicated for uncontrolled diabetic patients but if conditions are favorable, then this type of prosthesis can be planned.Proper medication must be provided before and after implant placement. Patient should maintain their sugar level even after the surgical placement of implants.

Conclusion:

Diabetes is a common metabolic disorder associated with hyperglycemia and its complications. Management of diabetic dental patient should focus on general oral health & the delivery of comprehensive dental care with minimal disruption of metabolic homeostasis.Its important to give a proper prosthodontic care to diabetes patient inspite of the complications they posses.Good oral&denture hygiene maintenance and proper dental check up is a pre requisite for ensuring the long term successful Prosthodontics treatment.

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