Review Article

Diabetes mellitus: Dental consideration

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ABSTRACT

Diabetes mellitus is one of the most frequently encountered pathologies by dentists as a result of its high prevalence worldwide. It is diagnosed by obtaining a fasting plasma glucose levels of 126 mg/dl or higher or glycosylated hemoglobin of 6.5% or higher. Diabetes (especially, if it is uncontrolled) is associated with a greater risk of periodontal disease, which is the most frequent complication. Other commonly reported manifestations are sialadenosis, xerostomia, and burning mouth syndrome. Dental caries, oral lichen planus, and candidosis, based on recent studies, are not significantly higher incidence in these patients. For dental treatment, the type of diabetes suffered, the treatment given for the disease, and the glycemic control status (using the glycosylated hemoglobin test) should be known. Patients should receive short early morning appointments to reduce stress and anxiety. The dentist has to be aware of the possible occurrence of an acute complication (hypoglycemia or hyperglycemia). Furthermore, these patients suffer from delayed wound healing and major susceptibility to infections.

KEY WORDS: Diabetes, Extraction, Glucose, Hyperglycemia, Hypoglycemia

INTRODUCTION

Diabetes mellitus (DM) is a chronic disease that occurs when the pancreas does not engender enough insulin (a hormone that regulates blood sugar) or alternatively when the body cannot efficaciously utilize the insulin it engenders. The overall risk of dying among people with diabetes is at least double the peril of their peers without diabetes.[1] The term DM describes a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with perturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The effects of DM include long-term damage, dysfunction, and failure of sundry organs.

DM may present with characteristic symptoms such as polydipsia, polyuria, and polyphagia. In its most rigorous forms, ketoacidosis or a non-ketotic hyperosmolar state may develop and lead to stupor, coma, and, in the absence of efficacious treatment, death. Often symptoms are not rigorous or may be absent, and consequently, hyperglycemia adequate to cause pathological and functional changes may be present for a long time afore the diagnosis is made. The long-term effects of DM are as follows:[2,3]

1. Retinopathy,
2. Nephropathy,
3. Autonomic neuropathy,
4. Peripheral neuropathy,
5. Cardiovascular disease.

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ORAL HEALTH COMPLICATIONS OF DIABETES

The sixth complication of diabetes.

The most mundane oral health quandaries associated with diabetes are as follows:

- Periodontal disease.
- Gum disease.
- Salivary gland dysfunction.
- Fungal infections.
- Oral burning and taste impairment.
- Oral mucosal diseases including lichen planus and recurrent aphthous stomatitis.
- Dental caries.
- Traumatic ulcers and exasperation fibroma.[4]

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Periodontal Disease

Periodontitis has been referred to as the sixth complication of diabetes. Diabetes is believed to promote periodontitis through an aggrandized inflammatory replication to the periodontal microflora. The subgingival microflora in patients with periodontitis who have DM generally is identically tantamount to that observed in patients with periodontitis who do not have a diagnosis of diabetes.[5]

Risk assessment is consequential because it has been apperceived that the more risk factors a patient has, the more likely he or she is to develop the disease. There is often more than an additive effect, and there is a synergistic effect between these risk factors. Identification and consideration of these risk factors are critical to prosperous periodontal treatment because they can affect the onset, the rate of progression, and the astringency of periodontal disease. In integration, these risk factors may determine treatment strategies and explicate variability in the therapeutic replications of patients. Risk factor assessments can alter the way patients are viewed by the practitioner, leading to a decision process predicated on jeopardy. The primary goal of the practitioner would be risk reduction. A number of studies found a higher prevalence of periodontal disease among diabetic patients than among salubrious controls. However, a recent survey has denoted that most patients with DM are incognizant of oral health complications of their disease.[6] In an immensely colossal cross-sectional study, Grossi and others showed that diabetic patients were twice as likely as non-diabetic subjects to have annexation loss. Firatli[7] followed type 1 diabetic patients and salubrious controls for 5 years. The people with diabetes had significantly more clinical affixment loss than controls. In another cross-sectional study, Bridges and others found that diabetes affected all periodontal parameters, including bleeding scores, probing depths, loss of affixment, and missing teeth. In fact, one study has shown that diabetic patients are 5 times more liable to be partially edentulous than non-diabetic subjects.[8,12] People with type 1 and 2 diabetes appear equipollently susceptible to periodontal disease and tooth loss. Periodontitis is a clinical complication of DM. Furthermore, approximately 30% of people with DM have undiagnosed DM. Consequently, the dental office is a health-care site that can avail identify undiagnosed DM, which can lead to better management of the care of patients with diabetes. A recent study found that smoking increases the jeopardy of periodontal disease by proximately 10 times in diabetic patients.[9] According to these results, the management of diabetic patients should include vigorous recommendations to quit smoking. For both type 1 and 2 diabetes, there does not appear to be any correlation between the prevalence or the astringency of periodontal disease and the duration of diabetes.[10,11]

Gum Disease

This is a chronic bacterial infection that affects the gum tissue and bone that fortifies the teeth. If left untreated, gum disease can result in abscesses or the consummate eradication of the tooth's fortifying tissues and, ultimately, tooth loss.[20] Gum disease inclines to be more astringent among people who have diabetes because the disease lowers the facility to fight infection and slows rejuvenating. An infection causes blood sugar level to elevate, which makes diabetes more obstinate. Averting and treating gum disease can avail amend blood sugar control.[12]

The principles of treatment of periodontitis in diabetic patients are identically tantamount to those for non-diabetic patients and are consistent with our approach to all high-risk patients who already have periodontal disease. Salivary gland dysfunction dry mouth, or xerostomia, has been reported in 40–80% of diabetic patients. Salivary dysfunction, however, can be arduous to diagnose. Salivary flow may be affected by a variety of conditions, including the utilization of prescription medications and incrementing age, and it appears to be affected by the degree of neuropathy and subjective feelings of mouth dryness that may accompany thirst. Diabetic patients with poorly controlled disease have been found to have lower stimulated parotid flow rates than people with well-controlled DM and non-diabetic control subjects. Asymptomatic bilateral enlargement of the parotid glands has been reported in 24–48% of patients with DM, and patients with uncontrolled DM have exhibited a more preponderant propensity for enlargement. Uncontrolled diabetes can decrement the saliva flow and cause dry mouth. A lack of saliva in the mouth sanctions bacteria to accumulate. This increases the jeopardy of developing halitosis (malodorous halitus), tooth decay, and gum diseases. The most mundane complications of dry mouth or xerostomia include arduousness in masticating, verbalizing, swallowing, and the competency to taste. To mitigate dry mouth, sip dihydrogen monoxide throughout the day, masticate sugarless gum or suction on sugarless mints, or utilize a mouth moisturizer available over the counter.[13]

Oral Burning and Taste Perturbances

Clinician should consider DM in the diagnosis of quandaries such as burning mouth or tongue. The burning may be due to peripheral neuropathy, xerostomia, or candidiasis. Good glycemic control may alleviate burning sensation. Reports have designated that clonazepam may be salutary in some patients with repine of oral burning sensation. Taste perturbances have been reported in patients with DM,[14] but all investigators have not observed this finding. Perros

et al. reported that some diabetic patients have a mild impairment of the saccharine taste sensation. This may be cognate to xerostomia or disordered glucose receptors.

Oral Mucosal Diseases

A number of types of oral mucosal lesions, including lichen planus and recurrent aphthous stomatitis, have been reported in people with DM. Not all study results have shown this sodality, and these are relatively prevalent disorders that often are observed in patients who do not have diabetes. Siudikiene *et al*.[15] reported that the prevalence of oral lichen planus is significantly higher in patients with type1 DM and marginally higher in patients with type 2 DM than in control subjects. However, this may be a side effect of oral hypoglycemic agents or antihypertensive medicines.[18,19,21]

Dental Caries

Some studies have demonstrated that diabetic patients have more active dental caries than control subjects. Furthermore, a reduction in salivary flow has been reported in people with diabetes who have neuropathy, and diminished salivary flow is a jeopardy factor for dental caries. The literature presents no consistent pattern regarding the relationship of dental caries and diabetes. However, low carbohydrate diabetic diets should theoretically reduce caries prevalence.

TRAUMATIC ULCERS AND EXASPERATION

One such study[15] recently reported that people with type 1 diabetes have a higher prevalence of oral traumatic ulcers and exasperation fibromas than do non-diabetic control subjects. These findings may be cognate to altered wound rejuvenating patterns in these patients.

DENTAL MANAGEMENT CONSIDERATION

To minimize the jeopardy of intraoperative emergency, clinicians need to consider a number of management issues afore initiating dental treatment.

MEDICAL HISTORY

Before dental treatment, the dentist must obtain a good medical history which betokens the type of diabetes suffered and frequency of hypoglycemic episodes or complications. Antidiabetic medications, dosages times of administration, and status of diabetes control should be resolute. According to the recent consensus of the American Diabetes Sodality (2010),[1,16] glycosylated hemoglobin, i.e., HbA1c ≥ 6.5%, a pre-prandial glycemia of ≥126 mg/dl, and a postprandial glycemia ≥200 mg/dl are suggestive diagnostic values of diabetes.

SCHEDULING OF VISITS

In general, morning appointments are advisable since endogenous cortisol levels are generally higher at this time (cortisol increases blood sugar levels). For patients receiving insulin therapy, appointments should be scheduled so that they do not coincide with apexes of insulin activity since that is the period of maximal risk of developing hypoglycemia.

DIET

It is consequential for clinicians to ascertain that the patients have eaten customarily and taken medications as customary. If the patient skips breakfast due to the dental appointment but stills takes the mundane dose of insulin, the jeopardy of a hypoglycemic episode is incremented. For certain procedures (e.g., conscious sedation), the dentist may request that the patients alter his or her mundane diet afore the procedure. In such cases, the medication dose may need to be modified in consultation with patient's medico.

BLOOD GLUCOSE MONITORING

Depending on the patient's medical history, medication regimen, and procedure to be performed, dentists may need to quantify the blood glucose level afore beginning a procedure. This can be done utilizing commercially available electronic blood glucose monitors, which are relatively inexpensive and have a high degree of precision. Patients with low plasma glucose levels (<70 mg/dl for most people) should be given an oral carbohydrate afore treatment to minimize the peril of a hypoglycemic event. Clinician should refer patients with significantly elevated blood glucose levels for medical consultation afore performing elective dental procedures.[17]

RECOMMENDATIONS ON CLINICAL CARE FOR PEOPLE WITH DIABETES

1. Edification of people with diabetes should include explication of the implicative insinuations of diabetes, concretely poorly controlled diabetes, for oral health, especially.
2. Look for early denotements of gum disease: Report any denotements of gum disease – including redness, swelling, and bleeding gums – to a dental hygienist. Withal mention any other signs and symptoms such as dry mouth, loose teeth, or mouth pain. In those people with possible symptoms of gum disease, advise them to seek early attention from dental health.

3. Maintain good oral hygiene: Brush twice a day for 2 min with a soft toothbrush and fluoridated toothpaste.

CONCLUSION

DM is a disease, of which the general public and practicing dentists and dental hygienists should be cognizant. On the substructure of the available data, we can conclude that practicing dentists and dental hygienists can have a consequential, positive effect on the oral and general health of patients with DM. It is paramount for the dentist to be vigilant with the medical management of the patients with DM and to apperceive the denotements and symptoms of the undiagnosed or poorly controlled disease. By taking an active role in the diagnosis and treatment of oral conditions associated with DM, dentist may additionally contribute to the maintenance of optimal health in patients with this disease. Periodontal disease is the main oral clinical manifestation in diabetic patients. Periodontal treatment may eventually be covered by medical indemnification, which could include consultations, diagnostics, and therapeutics. These patients should be cognizant of their incremented susceptibility to infections and delayed wound rejuvenating. Well-controlled diabetics can be treated in the dental office similarly to non-diabetic patients, but morning appointments are preferable, and patients should be injuctively authorized not to expeditious, to reduce the peril of the occurrence of hypoglycemia.

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