

## Management of Medically Compromised Patient in Periodontal Practice: An Overview (Part 1)

Monali Shah<sup>1\*</sup> Deepak Dave<sup>2</sup> Rahul Dave<sup>3</sup> Ashit Bharwani<sup>4</sup> Amit Shah<sup>5</sup>

<sup>1</sup> Professor, Department of Periodontics, K. M. Shah Dental College and Hospital, Baroda, India.

<sup>2</sup> Professor & Head, Department of Periodontics, K. M. Shah Dental College and Hospital, Baroda, India.

<sup>3</sup> Post Graduate Student, Department of Periodontics, K. M. Shah Dental College and Hospital, Baroda, India.

<sup>4</sup> Senior Lecturer, Department of Periodontics, K. M. Shah Dental College and Hospital, Baroda, India.

<sup>5</sup> Associate Professor, Department of Medicine, Sumandeep Vidyapeeth, Baroda, India.

### ABSTRACT

**Background:** Periodontal management of the medically compromised patients require acquisition of complete health history as well as dental history of the patient. This should include documentation via questionnaire as well as a verbal history. Preferably an oral history should also be obtained as a review of systems. The dental history should also include questions related to current oral conditions such as periodontal disease or oral ulceration and past dental treatment and potential complications from prior intervention including treatment failure and the delivery of anesthesia or post-treatment medication.

The first step in managing the patients with medical problems is acquiring thorough health history of the patients. The second step for the periodontist is to fully understand the significance of the diseases that may have affected the patient. Each identified condition can affect periodontal treatment in a unique manner. The periodontist needs to understand the potential complications that can occur as a consequence of the treatment of a medically compromised patient. Also deciding pre-treatment or post-treatment medication or emergency care is required.

This part of review focuses on a number of medical problems that the periodontist might encounter in daily practice that necessitate extra knowledge and care to prevent potential complications causing otherwise unnecessary morbidity and mortality of the patients. These include diabetes, multiple drug interactions and important cardiac diseases.

**Keywords:** Diabetes mellitus, Endocarditis, Myocardial Infarction, Drug reactions, periodontal practice.

### INTRODUCTION

As the health care facilities are increasing, substantial numbers of people that are elderly are being diagnosed with systemic diseases that can affect oral health and their periodontal treatment. The periodontal management of these medically compromised patients can be problematic in terms of complications, dental



therapy, and emergency care.

Examination of the patient with a history of medical problems should be more extensive than that associated with the normal healthy patient. Physical assessment should include evaluation of the patient's general appearance like weight, posture, skin, nails, blood pressure temperature, pulse rate, respiratory rate and a thorough head and neck inspection including assessment of lymph nodes. In patients that present with problems

Received: Dec. 15, 2012; Accepted: Dec. 30, 2012

\*Correspondence: Dr. Monali Shah

Professor, Department Of Periodontics, K. M. Shah Dental College And Hospital, Sumandeep Vidyapeeth, Baroda, India.

Email: monalishah2010@yahoo.com

identified at examination that have not previously been reported, the periodontist can be instrumental in defining potential pathology and making the appropriate referral for additional medical evaluation. Such patients should be referred for medical assessment prior to any periodontal treatment.

Planning for dental treatment in the medically compromised patients primarily involves having an understanding of the nature of the patient's disease and how it can impact their physiology and their response to periodontal treatment and post treatment healing. The following are the systemic conditions which might alter the course of the periodontal treatment.

### Diabetes

In patients with well controlled diabetes, no extra specific treatment is required for routine periodontal therapy including prophylaxis. Morning appointments are recommended because cortisol levels are highest at this time and will provide the best blood glucose level. Patient should be instructed that morning meal should not be skipped<sup>1</sup>.

The type 1 diabetes patient should not be scheduled immediately after an insulin injection because this may result in a hypoglycemic episode. Special care should be taken while administering local anesthesia.

In the moderately-controlled diabetic patient, if a major procedure is planned like flap surgery, antibiotics should be prescribed following the surgery. After surgery the patient's food intake should include the proper caloric content and protein/carbohydrate/fat ratio to maintain glucose balance.

In the uncontrolled diabetic patient, only acute dental infection should be treated on emergency basis. Delivered anesthetic should not contain epinephrine. Antibiotics should be prescribed following treatment and monitored carefully for its efficacy. Intervention by physician is recommended for more complicated dental treatment because precise insulin management and post treatment care with respect to infection and body electrolyte balance may be needed.<sup>2</sup>

### Infective Endocarditis

In 2007, the American Dental Association and its Council on Scientific Affairs published a position paper that provided newly revised guidelines for the prevention of infective endocarditis (IE). These guidelines reflected current research assessing dental procedure related bacteremia, endocarditis, and the most common pathogens associated with the condition. The new guidelines reduced the classes of patients for whom antibiotic prophylaxis is recommended because the risk of morbidity resulting from antibiotic use outweighs its probable advantages<sup>3</sup>.

Multiple studies suggest that periodontal flap surgery, scaling, root planing, deep curettage can cause a bacteremia. But because of potential allergy, resistance, and cost-effectiveness, among other factors, the researchers have restricted the classes of patients for whom short-term antibiotic prophylaxis before dental procedures is recommended<sup>4</sup>.

The classes of conditions warranting antibiotic coverage include patients with artificial heart valves, patients with history of infective endocarditis or having cardiac transplant that developed a heart valve problem, and patients with a congenital heart condition that includes repaired cyanotic congenital heart disease with shunts, repaired congenital heart defects with prosthetic devices having been placed during the first 6 months after the procedure, and any repaired congenital heart defect with residual defect.

American Dental Association, American Medical Association, and American Heart Association have recommended prophylactic antibiotic regimen for the above conditions in the year 2007 which are as follows:

- Able to take oral medication: Amoxicillin 2 g (50 mg/kg)
- Unable to take oral medication: Ampicillin 2 g IM or IV (50 mg/kg IM or IV); Cefazolin or ceftriaxone 1 g IM or IV (50 mg/kg IM or IV)
- Allergic to penicillin or ampicillin: Cephalexin 2 g (50 mg/kg); Clindamycin 600 mg (20 mg/kg); Azithromycin or clarithromycin 500 mg (15 mg/kg)

- Allergic to penicillin or ampicillin and unable to take oral medication: Cefazolin or ceftriaxone 1 g IM or IV (50 mg/kg IM or IV); Clindamycin 600 mg IM or IV (20 mg/kg IM or IV).

### Ischemic Heart Disease with Angina

The patients with mild or moderate angina should be reminded to have with them their nitroglycerin tablets handy in case of an attack during periodontal treatment. The periodontist should always have an updated stock of such emergency medications in his clinic. Additionally, oxygen deprivation in the patients with severe ischemic disease and angina can be avoided by delivery of oxygen via nasal cannula at 3L/min during periodontal treatment on precautionary basis.

Anticholinergic drugs used to reduce salivary flow during long periodontal surgical procedures should be avoided because of the increased risk of pneumonia in patients with concomitant pulmonary edema<sup>5</sup>.

### Myocardial Infarction

Although relatively rare in the dental setting, cardiac arrest as a result of myocardial infarction (MI) can occur. In patients with a history of MI, any periodontal treatment should be pursued after at least 6 months of the cardiac event. The patient's physician should be consulted prior to treatment and proper knowledge regarding the patient's current cardiac status should be sought. As with the ischemic patient, short morning appointments are best. The combination of an MI with congestive heart failure increases risk for the patient so only emergency treatment should be provided in such conditions unless and until physician gives the consent of normal health. The onset of chest pain and shortness of breath during treatment warrants discontinuation of the procedure and immediate medical consultation or hospitalization<sup>5</sup>.

Several other considerations related with cardiac instability are imperative to consider. For example, a patient post MI may be on anticoagulant and the dose may have to be reduced if periodontal surgery is necessary. But this point is still a matter of controversy as prolonged aspirin use can affect bleeding time. Potential complications can be

avoided by acquiring a prothrombin time on the day of surgery to verify the patient's ability to clot. In patients with pacemakers with metal, electrocautery and the use of a magneto-strictive scaler should be avoided.

### Congestive Heart Failure

The challenges in treating the patients with congestive heart failure are several. The condition is often confounded by hypertension, a history of MIs, thyrotoxicosis, renal failure and chronic obstructive pulmonary disease (COPD). Antibiotics need to be prescribed following treatment to prevent infection. The amount of epinephrine delivered can be a significant confounder for the disease. The periodontist treating the patient with congestive heart failure should be prepared for potential complications.

Consequently, in the patient with multiple co-morbid conditions, only urgent dental needs should be provided. For the patients who are seemingly stable and without significant complications, routine prophylaxis can be performed. Prior to treatment, prothrombin time should be obtained, and, during treatment, the patient should be placed in an upright position to prevent additional pulmonary fluid collection.

### Drug Reactions

With the aging of the population, more and more people are taking single and multiple drug regimens for medically complex problems. Some of these medications can interact with drugs typically prescribed by periodontists, with over-the-counter drugs (OTC), with naturopathic preparations taken by the patients and even with alcohol, if consumed by the patient. Prescribed medications can cause a spectrum of allergic reactions and secondary intraoral effects such as gingival hyperplasia and other mucosal pathology<sup>6</sup>.

Medications that are usually prescribed by the periodontists and that can be problematic in the patient taking medication for systemic diseases are anesthetics, analgesics, and antibiotics. The severity rating for drugs within these classes varies from major, moderate and minor. The risk of drug interactions is dependent on patient's age, gender and relative health.

### Local anesthetics

Local anesthetics can be associated with toxicity (central nervous system and cardiac problems), allergy, and hemoglobin abnormality (methemoglobinemia). Also  $\beta$ -blockers are sometimes found to result in acute hypertension. Such an interaction is most likely to occur with intravascular injection of anesthetic agent so it is recommended to administer one half of the cartridge that has 1:100,000 epinephrine, with the patient monitored closely during subsequent injections. An excessive dose of prilocaine combined with dapsone can lead to methemoglobinemia<sup>7</sup>.

### Pain killers

Non Selective Anti Inflammatory Drugs are typically used for moderate pain, including pretreatment and post-treatment periodontal pain especially after the periodontal surgery. Their long-term use has been linked with gastrointestinal problems, including bleeding, ulceration, kidney damage and cardiovascular problems. In addition, blood pressure medication may also be compromised by co-prescription of NSAIDs.

### Antibiotics

Antibiotics of concern for periodontist include tetracyclines, metronidazole, erythromycin, etc. The alcoholic patient if prescribed metronidazole may experience flushing, headache, palpitation, and nausea. This antibiotic also increases blood lithium levels in the patient using the drug to manage bipolar disorder by inhibiting renal excretion. This can lead to confusion, ataxia, and renal damage. In patients on digoxin (digitalis) for atrial flutter, atrial fibrillation, or congestive heart failure, the blood drug level may be elevated when erythromycin or tetracyclines are prescribed which can lead to increased salivation, visual disturbances, and arrhythmias<sup>8</sup>.

In patients taking the anticoagulants like warfarin and anisindione to prevent emboli, a prescription of tetracyclines or other broad-spectrum antibiotic may modify vitamin K synthesis in gut and, in the lack of vitamin K supplementation, can increase the risk of bleeding and hematuria<sup>9</sup>. Doxycycline used in periodontal treatment very commonly not recommended in women who are

pregnant or breastfeeding or in children under the age of 8 because of potential bone and tooth development abnormalities. Clinical studies suggest that this medication alters estrogen and progesterin in birth control preparations, potentially rendering the oral contraceptive ineffective. The interaction of this drug has also been reported with penicillin, erythromycin, tetracycline, and cotrimoxazole, although the failure of oral contraceptives when coupled with these antibiotics remains controversial.

### CONCLUSION

The periodontal management of the medically compromised patients should be done with utmost care and caution. There are many controversies in the field but clinician should always keep in mind extra caution on his part while treating such patients as it will eventually result in a non complicated and safe treatment. Periodontist should always be prepared for any complications that might occur by having knowledge of the medical conditions and emergency drugs. So the complications would be avoided rather than treated, thus gaining patients as well as self-confidence while treating such patients.

### CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

### REFERENCES

1. Wray L. The diabetic patient and dental treatment: an update. *Br Dent J.* Sep 9 2011; 211(5):209-15.
2. Lalla RV, D'Ambrosio JA. Dental management considerations for the patient with diabetes mellitus. *J Am Dent Assoc.* Oct 2001; 132(10):1425-32.
3. Wilson W, Taubert KA, et al. Prevention of Infective Endocarditis, Guidelines from the American Heart Association. A Guideline from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on

- Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. J Am Dent Assoc. 2007; 138(6):739-45, 747-60.
4. Smith A, et al. Management of infection control in dental practice. J Hosp Infect. J Hosp Infect. 2009; 71(4):353-358.
  5. Shuman SK. A physician's guide to coordinating oral health and primary care. Geriatrics. 1990; 45(8):47-57.
  6. Hersh E, Moore P. Drug interactions in Dentistry. J Am Dent Assoc. 2004; 136(3):298-311.
  7. Becker DE, Reed KL. Essentials of local anesthetic pharmacology. Anesth Prog. 2006; 53(3):98-109.
  8. Rose LF, et al. Oral care for patients with cardiovascular disease and stroke. J Am Dent Assoc. 2002; 133(1):375-445.
  9. K Ganda. Management of the medically compromised dental patient; part 1. 2006. Available from <http://ocw.tufts.edu/data/29/368617.pdf>.

