

Periodontal management of medically compromised patients (part 1)

Many patients seeking dental care have significant medical conditions that may alter both the course of their oral disease and the therapy provided. The older age of the periodontal patient increases the likelihood of underlying disease. Therefore the therapeutic responsibility of the clinician includes identification of the patient's medical problems to formulate proper treatment plans.

Thorough medical histories are important and sometimes consultation with or referral of the patient to an appropriate physician may be indicated. This ensures correct patient management and provides medico-legal coverage to the clinician.

From the most common medical problems are the following:-

1. Cardiovascular diseases:-

These diseases are the most prevalent category of systemic disease and more common with increasing age. They include **hypertension, angina pectoris, myocardial infarction, previous cerebrovascular accident, congestive heart failure, presence of cardiac pacemakers and infective endocarditis**. In most cases the patient's physician should be consulted, especially if stressful or prolonged treatment is anticipated. Short appointments and a calm, relaxing environment help to minimize stress.

a) Hypertension:-

It's the **most common cardiovascular disease** and it is defined as a systolic blood pressure of **140 mmHg or greater**, or a diastolic blood pressure of **90 mmHg or greater**, and it's not diagnosed on a single elevated blood pressure recording but it's based on the average value of three or more blood pressure readings taken at three or more appointments. If hypertension persist and increase in severity, it may lead to coronary heart disease, angina, congestive heart failure, cerebrovascular accident or kidney failure.

Management of those patients will be as follows:-

- 1- No periodontal treatment should be given to a patient who is hypertensive and not under the medical management.
- 2- Stress free, calm and relaxing environment with short appointments.
- 3- The dentist should inform the physician about the degree of stress, blood loss and length of the periodontal procedure so that to avoid excessive bleeding.
- 4- Local anesthesia **without epinephrine may be used for short procedures**

(less than 30 minutes) or use local anesthesia with an epinephrine concentration not more than 1:100,000 to control pain and minimize stress. An aspirating syringe should be used since epinephrine in the anesthetic solution may get into blood and may raise blood pressure. (dental treatment for hypertensive patients is generally safe as long as stress is minimized).

5- **Postural hypotension** is common with patients on antihypertensive drug and can be minimized by slow positional changes in dental chair.

b) Angina pectoris:-

Angina occurs when myocardial oxygen demand exceeds supply, resulting in temporary myocardial ischemia. Patients with a history of **unstable angina pectoris** (angina that occurs irregularly or on multiple occasions without predisposing factors) should be treated for emergencies only and in consultation with the patient's physician. Patients with a history of **stable angina pectoris** (angina that is associated with stress and easily controlled with medication and rest) **can be treated with the following precautions:-**

1. Premedication if needed as valium.
2. Morning and short appointments.
3. Nitroglycerin medication sublingually 5 minutes before the procedure.
4. If a patient with a history of angina **experiences chest pain** during the periodontal surgery, the treatment must be stopped; the patient should be given Nitroglycerin **0.3 – 0.6 mg** sublingually and oxygen and be kept sitting upright.

c) Myocardial infarction:-

Periodontal treatment should not be done for at least 6 months following myocardial infarction because the peak mortality rate occurs during this time. After 6 months, the patient can be usually using the similar precautions of stable angina patient.

d) Previous cerebrovascular accident (CVA):-

CVA or stroke occurs as a result of ischemic changes (e.g. **cerebral thrombosis**). Hypertension and atherosclerosis are predisposing factors to a CVA.

The periodontal management include the following:-

- 1- No periodontal therapy should be performed for 6 months after the stroke because of high risk of recurrence during this period.
- 2- After 6 months, periodontal therapy may be performed with short appointments and minimal stress.

3) Those patients usually are placed on oral anticoagulants so for procedures with significant bleeding as periodontal surgery, the anticoagulant medications must be adjusted in consultation with the physician and to check the **prothrombin time not more than 1.5 times normal (11-14 seconds normally) (depending on laboratory) and international normalized ratio (INR):Normal = 1.0 .**

4) Monitor the blood pressure because of recurrence rate of CVA is high.

e) **Congestive heart failure:-**

Is a condition in which the pump function of the heart is unable to supply sufficient amounts of oxygenated blood to meet the body's needs.

Patients with treated congestive heart failure should be **manages** as follows:-

1) The patients taking diuretics so watch for susceptibility to orthostatic hypotension.

2) The patients taking dicumarol which is anticoagulant so consult with the physician to check prothrombin time.

3) The procedures should be short with less stress.

f) **Cardiac pacemakers:-**

Some cardiac arrhythmias are treated with implantable pacemakers which usually implanted in the chest wall and enter the heart transvenously. These electrical devices are used to regulate heart beats and on electro- physiologic problems may occur with such implanted device. Management of such patients will be as follows:-

1) Consult with the physician to get information about the underlying cardiac reason for pacing and to explain the periodontal treatment plan to him.

2) The patient should be positioned so that minimal pressure will be exerted on the implant site.

3) Limited use of electrical dental equipment that generates electromagnetic fields such as ultrasonic devices so that to avoid interference with the artificial pacemakers. **Try to keep these devices at least 30 cm from the patient.** However, most pacemakers are adequately shielded to prevent these changes.

g) **Infective endocarditis:-**

It's a disease in which microorganisms colonize the damaged endocardium or heart valve. It is a serious disease with poor prognosis. The term infective endocarditis is preferred to the previous term bacterial endocarditis because the disease can also be caused by fungi and viruses. The organisms most commonly encountered in IE are a-hemolytic streptococci (e.g streptococcus viridans). Other microorganisms

found in the periodontal pockets and associated with this disease are *Eikenella corrodens*, *Aggrigatibacteractinomycetemcomitans*, *Capnocytophaga* and *Lactobacillus* species. The practice of periodontics is intimately concerned with the prevention of IE. Any dental procedures that involve bleeding may induce a transient bacteremia, so prophylactic antibiotic should be recommended before the procedure which is associated with significant bleeding as periodontal surgery, scaling and root planning. However, bacteremia may occur even in the absence of dental procedures, especially in individuals with poor oral hygiene and significant periodontal inflammation.

The **preventive measures** to reduce the risk of IE should consist of the following:-

1) Define the susceptible patient: Those patients at high risk to develop IE following dental treatment include those with rheumatic heart disease, congenital heart disease, cardiac surgery, prosthetic heart valves.

2) Provide oral hygiene instruction: in patients with significant gingival inflammation, oral hygiene should be initially limited to gentle procedures (i.e oral rinses as chlorhexidin mouth rinse and gentle tooth brushing with soft brush). As gingival health improves, more aggressive oral hygiene may be initiated.

3) During periodontal treatment, recommended prophylactic antibiotic regimens should be practiced with all susceptible patients. The regiment used is the following:-

Regimen Antibiotic Dosage

Patient group	Antibiotic	Route	Dose		Timing before procedure
			Adults	Children	
Standard general prophylaxis for patients at risk	Amoxicillin	PO	2 g	50 mg/kg	1 hour
Unable to take oral medication	Ampicillin	IV or IM	2 g	50 mg/kg	Within 30 minutes
Allergic to penicillin/ amoxicillin/ampicillin	Clindamycin	PO	600 mg	20 mg/kg	1 hour
	Cephalexin or cephadroxil ^a	PO	2 g	50 mg/kg	1 hour
	Azithromycin or clarithromycin	PO	500 mg	15 mg/kg	1 hour
Allergic to penicillin/ amoxicillin/ampicillin and unable to take oral medications	Clindamycin	IV	600 mg	20 mg/kg	Within 30 minutes
	Cefazolin	IV	1 g	25 mg/kg	Within 30 minutes

Note: IV = intravenous; PO = oral.

^aCephalosporins should not be used with penicillin or ampicillin in those with a history of anaphylaxis, angioedema or urticaria.

4) **Periodontal treatment should be designed** according to the degree of severity and involvement of periodontal tissues:- Periodontal therapy is a prolonged procedure, it is mostly not a one day antibiotic regimen, multiple visits and easily periodontal treatment plans must be developed for patients susceptible to IE and as follows:-

a. In order to reduce the wide range systemic effect of periodontal disease in these patients, teeth with severe periodontitis and poor prognosis have to be **extracted rather than retained** and treated.

b. All periodontal treatment procedures (**including probing**) require antibiotic prophylaxis. Pretreatment **chlorhexidin mouth rinse** are recommended before all procedures because it reduce the presence of bacteria on mucosal surfaces.

c. Reduce the number of visits required so that to minimize the risk of developing resistant bacteria.

d. It's preferably that the appointments allowed between **10-14 days**, if it's not possible then select an alternative antibiotic regimen.

e. The need for antibiotic prophylaxis before suture removal is controversial when possible use the **resorbable sutures** in such patients.

f. Regular recall appointments are important with reinforcement on good oral hygiene to maintain periodontal health.

2. **Renal diseases:-**

Patients with chronic renal failure have a progressive disease that may require **kidney transplantation or dialysis**.

The patients who are receiving hemodialysis require special precautions. Those patients have a high incidence of viral hepatitis, anemia and prolonged hemorrhage. The risk of hemorrhage is related to anticoagulant during dialysis. Also they have either an internal arteriovenous fistula or an external arteriovenous shunt. This shunt is often located in the arm and must be protected from trauma.

The management of those patients will be as follows:-

1) Consult with patient's physician.

2) Screen for hepatitis B surface antigen and antibodies prior to any treatment.

3) Avoid drugs that metabolized by the kidney ex. Tetracycline, streptomycin, aminoglycoside, aspirin ... etc.

4) Provide antibiotic prophylaxis to prevent infective endocarditis.

5) Check blood pressure, blood urea nitrogen, serum creatinine, bleeding time, platelet count, partial thromboplastin time. (**normally bleeding time** = 1-6 min, **platelet count** = 150,000- 300,000/mm³).

6) Patients receive heparin anticoagulation on the day of hemodialysis, Periodontal treatment should be provided on the **day after** dialysis, when the effects of heparinization have subsided. Hemodialysis treatments are usually performed three or four times per week.

7) If arteriovenous fistula/shunt is present in the arm, blood pressure readings should be taken from the other arm. If A-V fistula is present in leg, patient is asked to avoid sitting with the leg dependent for longer than one hour.

Renal transplantation

Patients take immunosuppressive drugs that greatly reduce resistance to infection. Excessive bleeding can occur during or after periodontal treatment because of drug-induced thrombocytopenia or anticoagulation, or both.

So **management** of those patients will be as follows:-

- 1) Prophylactic antibiotic to prevent infection (prescribed by the physician).
- 2) May need supplemental corticosteroid.
- 3) Teeth with severe bone and attachment loss, furcation invasion, periodontal abscesses, or extensive surgical requirements should be extracted, leaving an easily maintainable dentition before transplantation to reduce possibility of infection.
- 4) Surgical excision of the gingiva may be needed because of gingival overgrowth secondary to cyclosporine therapy (preferably in the hospital under the supervision of the physician to control excessive bleeding).

3- Chemotherapy is a type of cancer treatment that uses one or more anticancer drugs (chemotherapeutic agents) as part of a standardized chemotherapy regimen. Chemotherapy may be given with a curative intent (which almost always involves combinations of drugs), or it may aim to prolong life or to reduce symptoms (palliative chemotherapy).

What precautions should be taken while treating the patient undergoing chemotherapy?

- (1) Consult patient's physician.
- (2) The treatment should be conservative and palliative.
- (3) Periodontal therapy is best done the day before chemotherapy is given, as WBC count is relatively high on that day. It should be done when WBC count are above 2000/mm³ with an absolute granulocyte count of 1000 to 1500/mm³.

4) Complete blood count is important

- ☒ Not enough red blood cells causes **anemia**. Symptoms include fatigue, dizziness, and shortness of breath.
- ☒ Not enough white blood cells causes leukopenia. This raises the risk of getting **infections**. If this happens, the patient need antibiotics as soon as possible.
- ☒ Platelet count. This test measures the number of platelets in the blood. Platelets are cells that stop bleeding. Not having enough platelets causes **thrombocytopenia**. The patient can bleed and bruise more easily than normal.