"DENTAL MANAGEMENT OF A PATIENT TAKING ANTICOAGULANTS"

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Introduction

Any patient receiving anticoagulant therapy has a potential bleeding problem. Most would be taking these medications for any of the following reasons:
- recent myocardial infarction
- cerebrovascular accident (stroke)
- thrombophlebitis (inflammation from a thrombus formation within a vein)
- patients who have had open heart surgery to correct congenital defects
- patients who have had diseased arteries or damaged heart valves replaced
- patients with rheumatoid arthritis taking aspirin
- atrial fibrillation (ineffective atrial contractions resulting from total disorganization of atrial depolarization)
- Review of some coagulation disorders

Inherited coagulation disorders

Hemophilia A (factor VIII deficiency): the most common inherited coagulation disorder. Patients bleed spontaneously into joints and soft tissue, and minor trauma can be associated with life-threatening bleeding.

Hemophilia B (factor IX deficiency or Christmas disease): identical to hemophilia A, with the same musculoskeletal problems and complications.

Acute or chronic leukemia: patients may have clinical bleeding tendencies because of thrombocytopenia, which is a decrease in the normal platelet count of 200,000-400,000/ mm©¯ to less than 150,000/mm©¯.

Von Willebrand's disease: a common inherited disorder in which prolonged bleeding time is associated with abnormalities of factor VIII. Patients usually have a history of spontaneous bleeding and episodes of bleeding from mucous membranes. Bleeding after a dental cleaning is common.

Acquired coagulation disorders (most common cause of prolonged bleeding)

Liver disease: since the liver produces most of the coagulation factors.
Vitamin K deficiency: needed by the liver to produce prothrombin.

Anticoagulation drugs and drugs that interfere with platelet function:
-heparin
-warfarin
-coumarin
-aspirin
-penicillin (long term)
-cephalosporins (long term)
-alcohol (chronic abuse)

Pathways for the coagulation of blood (intrinsic, extrinsic & common)

The blood coagulation factors:
I: fibrinogen
II: prothrombin
III: thromboplastin
IV: calcium
V: labile factor, proaccelerin, accelerator globulin
VI: not assigned
VII: proconvertin
VIII: antihemophilic factor
IX: thromboplastin component
X: Stuart-Prower factor
XI: thromboplastin antecedent
XII: Laki-Larand factor

Common anticoagulants

Warfarin (Coumadin), Dicumarol (Coumarin):
- use: prophylaxis and treatment of venous thrombosis, pulmonary embolism, thromboembolic disorders, and atrial fibrillation with risk of embolism.
- mechanism of action: interferes with the hepatic synthesis of vitamin K-dependent coagulation factors (II, VII, IX & X).
- drugs that increase bleeding tendency when used in combination with warfarin: salicylates, cephalosporins and penicillin.

Heparin (Hep-Lock):
- use: prophylaxis and treatment of thromboembolic disorders.
- mechanism of action: inactivation of thrombin and prevents the conversion of fibrinogen to fibrin.
- dosage: patients are admitted into the hospital and receive 5,000 units IV every 8-12 hours. This is titrated according to PTT results (usually 10-30 units/hour).

Other anticoagulants: Ardeparin, Dalteparin, Danaparoid, Enoxaparin

Normal control of bleeding
Vascular phase (begins immediately after the injury) - vasoconstriction in the area of the injury
Platelet phase (begins seconds after injury) - platelets and vessel walls become "sticky", a mechanical plug of platelets seals off openings of the cut vessels
Coagulation phase (occurs slower than other phases) - blood lost into surrounding area coagulates by extrinsic and common pathways; blood vessels in the area of injury coagulates through intrinsic and common pathways

Identification of a patient with a bleeding disorder
There are 4 methods in which a dentist can detect if their patient has a bleeding problem:

1. Thorough medical history
Bleeding problems in relatives
Bleeding problems following trauma or surgical procedures
Any history of spontaneous bleeding from the nose, mouth or ears

2. Physical examination
The patient looks jaundice or pallor
Spider angiomas are noted
Ecchymoses, petechiae, oral ulcers, spontaneous gingival bleeding or hyperplastic gingival tissues

3. Clinical laboratory tests
PT (prothrombin time):
- tests the extrinsic pathway and the common pathways
- achieved by mixing a sample of the patient's plasma with a preparation of thromboplastin and calcium ions.
- PT is determined by how long it takes for this sample to coagulate
- normal = 11-15 seconds (depends on the laboratory)

- more than 15 seconds is abnormal

PTT (partial thromboplastin time):
- tests the intrinsic and common pathways
- normal = 25-30 seconds (depends on the laboratory)

Bleeding time
- tests the platelet and vascular phases from a functional (quality) standpoint
- normal if adequate number (quantity) of platelets of good quality are present
- normal = 1-6 minutes

Platelet count
- tests the platelet phase
- measures amount (quantity) of platelets present
- normal = 200,000-400,000/mm©¯

4. Observation of excessive bleeding following a surgical procedure
   - This may be the first clue to an underlying bleeding problem.

The International Normalized Ratio (INR)

What is it?

-It was noted that variations in the PT reagent lead to different values when clinicians observed that the dosage of anticoagulants in the U.S was higher than that in Britain.
-The INR was introduced in 1983 by the WHO and it mandates the universal standardization of PT.
-The INR is a ratio of the PT that adjusts for the sensitivity of the thromboplastin reagents.
-An international sensitivity index (ISI) was established to quantify the sensitivity of the thromboplastin (human thromboplastin is a value of 1.0)

How the INR is calculated

-INR = the patient's PT/the control PT. A patient with a normal coagulation profile would have an INR value of 1.0.

The range the PT/INR should be for invasive dental care:

-Patients on anticoagulants undergoing invasive dental treatment should have a PT within 1.5-2.0 times the normal value and an INR in the range of 2.0-4.0.
-Current opinions suggest that an INR less than 4.0 is desirable for anticoagulated patients undergoing dental procedures likely to induce significant bleeding.

Objective of the INR:

-The objective of the INR is to standardize PT results obtained with different reagents, instruments and laboratories and to provide a universal scale for monitoring oral anticoagulant therapy.
-Therefore, the PT may not be the laboratory value of importance when evaluating the level of anticoagulation. The INR is the more reliable and sensitive value for determining the level of anticoagulation.
-The INR is now being used in the U.S by an increasing number of laboratories, and health care providers must understand its implications.
-Patients receiving continuous anticoagulant therapy usually undergo periodic monitoring (PT-INR test) once every other week.
-Some well informed patients might even know their most recent PT-INR test. However, for those who do not know the value, the dental practitioner would need to contact the patient's physician or the laboratory to obtain the information.

Altering anticoagulant therapy
Many physicians believe that continuous anticoagulant therapy should be withdrawn until anticoagulation levels are normal or near normal before surgical dental procedures (i.e., extractions and periodontal surgery) are performed. Physicians usually recommend withdrawing coumadin 2-5 days prior to surgery so that coagulation can return to near normal levels. Some physicians who advocate withdrawing coumadin recommend IV heparin administration to replace it. This is shorter acting with a half-life of 4-hours (its effects are reversed much faster than coumadin). Keep in mind that every time that coumadin therapy is stopped or altered, the patient is at an increased risk of developing a life-threatening thrombus.

Risk factors that need to be weighed when deciding to alter anticoagulation therapy:
- The nature of the dental procedure and the potential for bleeding (multiple extractions vice a single extraction).
- The seriousness of the patient's medical condition and the likelihood that a thrombus could develop (patients with artificial heart valves are at a very high risk of developing emboli).
- The patient's anticoagulation level at the time of the procedure.
- Wahl and Howell (1996) surveyed 230 physicians regarding whether they recommended altering anticoagulation therapy prior to undergoing certain dental procedures. Results: The majority would alter the medication for extractions, deep periodontal scalings and periodontal surgical procedures.

Some myths about anticoagulation therapy and dental care

There are many documented cases of serious bleeding problems resulting from dental therapy in patients receiving continued (no alterations) doses of anticoagulants. Fact: 7 out of 2400 cases of dental surgical procedures on patients receiving continuous anticoagulation therapy experienced uncontrolled bleeding. Moreover, this was thought to be due to concomitant administration of antibiotics (penicillin and erythromycin may enhance coumadin's anticoagulant effect).

No cases of embolic complications in patients whose coumadin therapy has been withdrawn for dental treatment has been documented. Fact: 4 out of 500 patients experienced fatal embolic complications soon after anticoagulant therapy was withdrawn.

Patients receiving continuous anticoagulant therapy who undergo dental surgery experience more postoperative bleeding than do patients with normal coagulation. Fact: Several studies have shown that there is little or no difference in terms of blood loss after dental surgery between patients receiving anticoagulant therapy and patients whose coagulation is normal. Even patients whose coagulation is normal can have bleeding problems.

Current literature review for managing dental patients taking anticoagulants

Wahl & Howell (1996) - When consulting with physicians, dentists should provide data that support continuation of anticoagulant therapy. If a physician insists on withdrawing anticoagulant therapy, the dentist should request that the physician manage that aspect of the patient's case.

Muzyka (1999) - Patients receiving coumadin with INR values between 2.0 and 4.0 undergoing oral surgery procedures did not have an increased bleeding over control groups whose coumadin has been discontinued. He concluded that there is no justification for altering coumadin treatment before dental extractions in a population with INR values between 2.0 and 4.0.

Wahl (2000) - It is safer to continue anticoagulant therapy during dental surgery than it is to withdraw it. Many physicians do not understand dental procedures, so it is not surprising that physicians more often recommend withdrawing anticoagulant therapy for procedures that are at low risk for causing bleeding. Dental practitioners should prescribe prophylactic antibiotics only when absolutely necessary, particularly those on continuous anticoagulation therapy because they can increase the patient's level of anticoagulation.

Conclusions

Dentists should never recommend withdrawal of continuous anticoagulant drugs without the physician's knowledge and agreement.

Practitioners should consult with the patient's physician if necessary to determine his/her most recent INR before dental surgery is performed. The INR should not exceed 4.0. If it does exceed this range, then the physician may recommend withdrawing the anticoagulant therapy or reducing the dosage until the level is within the therapeutic range so that dental surgery can be performed safely.

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