

The Management of Patients with Heart Disease in Local Dental Anesthesia

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Abstract

Dental treatment under local anesthesia and sedation, is of great benefit, but medical problems may arise, especially in patients with cardiovascular disease (CVD). Cardiovascular disease is the leading cause of death worldwide, with more than three-quarters of deaths reported in low-and middle-income countries. In dentistry, clinical procedures in patients with cardiovascular disease should be carefully evaluated, including the use of local anesthesia and sedatives. Although there is a long history of safe use of local anesthetics (LA) in healthy patients and those with complex medical situations, prophylactic and corrective measures should be taken to ensure the safe delivery of dental care in patients with heart disease.

Keywords: Local anesthesia; Heart disease; Patient safety; Dental procedure.

Letter to Editor

Cardiac ischemia

Cardiac ischemia occurs when the needs of the body in blood rich in oxygen are not satisfied, for lack of the contribution by the heart muscle. This is generally caused by atherosclerosis, that is to say when the coronary arteries that irrigate the heart muscle, become limited or blocked. If blood

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Received Date: 04-21-2023

Accepted Date: 05-10-2023

Published Date: 05-29-2023

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flow is not quickly restored, cardiac ischemia can lead to angina or chest, weakness, dizziness, loss of consciousness, cardiac arrhythmia or heart attack. This ischemic heart disease is a common condition in the general population, including patients presenting to dental services. Dental procedures may increase the likelihood of an anginal attack in patients with coronary artery disease (cardiac ischemia). Local anesthesia is commonly used during dental

procedures to relieve pain, but it can also have cardiovascular effects. Epinephrine, an additive found in local anesthetics [1] called (vasoconstrictor) can cause vasoconstriction and increase heart rate and blood pressure and therefore there will be a reduction in the amount of blood and oxygen reaching the heart. Cardiac ischemia can also cause ischemia to other organs or tissues: When the heart muscle does not get enough oxygen due to blocked coronary arteries, it can lead to heart dysfunction and decreased blood flow throughout the body, this lack of blood supply from these causes a decrease in the supply of oxygen and nutrients to the affected area. This can cause tissue damage and cell death if left untreated. Local anesthesia is a technique commonly used in dentistry to block pain in a specific area of the body. However, it can also cause ischemia if the blood supply to the area is restricted for too long. This can lead to tissue damage and even necrosis.

Arrhythmias

Dysrhythmias are abnormal heart rhythms caused by disturbances in pulse generation, conduction, or both, resulting in reduced efficiency of the heart pump. Arrhythmias is more common in people with cardiovascular disease [2] and can cause symptoms such as angina, dyspnea, palpitations or syncope. During dental procedures under local anesthesia, arrhythmias may occur, especially in patients treated with digoxin. These problems may arise due to Epinephrine contained in local anesthetic, due to its vasoconstrictive properties, may cause increased blood pressure and increased heart

rate in patients with heart disease, which can aggravate heart rhythm disorders.

High blood pressure

High blood pressure means that blood pressure and its circadian rhythm are erratic. It is lowest at night and highest in the morning. It increases with age and anxiety. Blood pressure below 140/90 mm Hg is considered normal. People who consistently have blood pressure above 160/90 mm Hg are considered hypertensive and should be treated as patients are at higher risk of stroke, heart failure, myocardial infarction and heart failure, renal failure. More than 95% of hypertensive patients are thought to have essential hypertension, which has no clear underlying cause. A small number of people may have diagnosable reasons such as endocrinological or kidney diseases. visits to the dentist can increase blood pressure due to stress, which causes the secretion of a natural vasoconstrictor which promotes the narrowing of vessels, and on the other hand, treatments, including local anesthesia containing a synthetic vasoconstrictor.

Anticoagulants

Patients with valve disorders, or a history of heart attacks or strokes, may receive anticoagulant therapy, which may affect bleeding during local dental anesthesia, because the use of anticoagulants may affect the blood clotting, which can lead to an increased risk of bleeding. Blood thinners work by reducing the blood's ability to clot, which can lead to prolonged bleeding and complications during or after a dental procedure.

Valvular diseases

Heart valve disease is a disorder that affects one or more of the four valves of the heart. Symptoms may include: fatigue, shortness of breath, chest pain, palpitations, dizziness and fainting. Dental operations including local anesthesia frequently result in transient bacteremia, which rarely lasts longer than 15 minutes [32]. However, bacteria can adhere to aberrant or damaged heart tissues, especially valves, which can induce endocarditis. The literature shows that between 3 and 40% of people with endocarditis have recently received dental care (including dental anesthesia).

Congenital heart disease

Congenital heart disease is a common developmental anomaly that can go unnoticed later, these heart diseases can be: congenital aortic or pulmonary stenosis, auricular septal malformations or ventricular-septal malformations. Local Dental anesthesia may be associated with an increased risk of complications in patients with congenital heart disease. Indeed, these patients may have structural heart abnormalities that affect blood flow, heart function and coagulation, increasing the risk of adverse effects during anesthesia.

There is specific support for each case of heart disease regarding local anesthesia

Patients with cardiac ischemia can often use a local anesthetic in dentistry without risk. However, before administering a local anesthetic, the dentist should carefully assess the cardiovascular health of the patient to reduce the risk of problems. The dentist

might inquire about the medications the patient is using to treat cardiac ischemia problem [3]. To reduce any impact on the cardiovascular system, it may be wise to schedule an appointment earlier in the day, and change the dose of local anesthetic. In order to ensure that the patient is recovering normally, the dentist should also regularly check the patient's vital signs during and after treatment.

The patient's cardiologist can be consulted by the dentist in case of uncertainty or risk. Certain methods of anesthesia, however, could be better than others. For people with myocardial ischemia, for example, local anesthesia without adrenaline can be suggested because adrenaline can increase blood pressure and heart rate. The selection and dosage of the local anesthetic of each patient must be personalized according to the current state of health and drug diet. To choose the best action plan, it may sometimes be necessary to consult the patient's cardiologist.

Patients with cardiac arrhythmias require special precautions during dental treatment, and the use of local anesthetics with vasoconstrictors may be contraindicated in patients with refractory arrhythmias. Dental treatment can best be accomplished in a controlled medical setting with careful cardiac monitoring. For these patients, the dentist may consider alternative anesthesia techniques, such as local anesthetics without vasoconstrictors or other sedation techniques. The decision to use local anesthesia should be made on a case-by-case basis, taking into account the patient's medical history, medication use, and general

health. The dentist should also be prepared to handle any potential cardiac emergencies that may arise during the procedure. electrocardiographic monitoring and other measures may be necessary to provide early warning of cardiovascular effects even if the procedure is done under local anesthesia.

Many hypertensive patients are undiagnosed or not well controlled. Blood pressure measurement in all patients undergoing dental treatment, particularly in known hypertensives, could be considered. Reducing episodes of hypertension during dental treatment may involve minimizing pain and anxiety through conscious sedation or hypnosis. The use of local anesthetic with adrenaline should be avoided in patients with uncontrolled high blood pressure as it may raise the blood pressure. It might be better to use local anesthetics without adrenaline. If an anesthetic containing adrenaline is required, the amount should be kept to a minimum. Throughout the process, the dentist must constantly check the patient's blood pressure and take all necessary measures to maintain a safe blood pressure. After the procedure, the patient should be observed to ensure that the blood pressure returns to normal. If necessary, the dentist can suggest that the patient consult the doctor for adequate monitoring of the hypertension. A patient who has received treatment should now have systolic blood pressure below 140 mm Hg and diastolic blood pressure below 80 mm Hg. Along with pharmacological therapy.

For patients on anticoagulants, the International Normalized Ratio (INR) method is used to report prothrombin time. Dentists should consult with the patient's

physician prior to performing local dental anesthesia to determine if a change in anticoagulant therapy is necessary. Aspirin and other nonsteroidal anti-inflammatory drugs may increase bleeding risk, while tetracyclines may decrease vitamin K production.

Aspirin therapy may be discontinued before dental procedures if significant bleeding is expected. patients taking blood thinners should use local anesthetic with caution. The dentist should make a thorough assessment of the patient's condition before the procedure, taking into account the medical history and current medications. Anticoagulants should, as far as possible, be stopped or modified before the intervention in collaboration with the attending physician. the dentist should be on the lookout for any excess throughout the operation as this could be a sign of poor blood clotting. Failures can be managed with local hemostasis procedures such as gauze pads soaked in hemostatic solution. The patient should be observed for some time after the procedure to ensure that wound is healing normally.

Concerning patients with valvular disease, The American Heart Association (AHA) recommends maintaining good oral health to reduce the risk of bacterial seeding that can pass through the blood during local dental anesthesia [4]. The role of dentists in reducing periodontal inflammation through professional therapy and oral hygiene education are emphasized. Antibiotic prophylaxis is recommended before dental procedures that induce bleeding, including the injection of an anesthetic. However, repeated courses of antibiotic therapy

increase the risk of developing resistant strains, so it may be advisable to combine the procedures or space them out by at least seven days. Chlorhexidine mouthwash is recommended as a local adjunct to systemic antibiotic prophylaxis before dental procedures.

It is important to remember that each congenital heart disease is distinct and can include a variable level of risk throughout the anesthetic procedure. Be properly grasping the specificities of congenital heart disease and choosing the most effective treatment strategy to reduce the risks of complications, it is essential that the dentist or meets the patient's cardiologist. Before the operation of local anesthesia, patient may be judicious in certain circumstances to carry out a heart examination.

The patient must be closely monitored throughout the intervention in case cardiovascular condition change. the patient's other health issues, such as pulmonary hypertension or heart rhythm problems, which may be related to congenital heart disease, should also be considered and additional precautions should be taken if necessary. Because each case of congenital heart disease is unique, each patient should have a personalized treatment plan.

The latest research and findings on dental anesthesia for patients with heart conditions: for “electronic anesthesia”

A new anesthesia technique has recently appeared. This is electronic anesthesia, carried out by means of a pen connected to a box. Thanks to this new technology, which

acts directly in the bone, therefore, closer to the areas to be numb, comfort is improved and overall efficiency is greatly increased.

Microprocessor or device-based anesthesia is another name for electronic anesthesia. With this method, numbing drugs are precisely delivered through an electronic device according to the patient's needs during the surgical operation. Electronic anesthesia allows for better depth control and requires smaller doses of numbing agents, which can reduce the risk of problems and speed up postoperative recovery. This method is still little used in the world because it requires specialized knowledge and training. Patients with heart problems can benefit from electronic anesthesia in several ways.

The patient's cardiovascular function can be monitored continuously and in real time, which can help identify any difficulties or changes in the patient's condition immediately. Those with heart problems, who might be more susceptible to the negative effects of anesthesia, may benefit the most. The precise control of anesthesia delivery provided by electronic anesthesia also reduces the possibility of problems caused by an overdose of anesthetic. Finally, electronic anesthesia offers additional versatility for treatments in patients with heart disease, as it can be used with a number of anesthetic techniques, such as local anesthesia, regional or general.

Micro injection

Fewer side effects, it is now possible to precisely target the area to be treated, by reducing the amount of anesthetic required.

Potential negative effects, such as decreased cardiac output, can thus be mitigated. The pain or discomfort associated with injecting the anesthetic can be reduced using certain local anesthetic procedures. For example, the use of vibrators or cooling equipment can help distract the patient's attention and lessen the pain associated with the injection.

Conscious sedation

Shorter recovery time: could allow the patient to recover faster and faster from the operation. come home earlier.

Railing methods

Dentists can accurately locate the nerve root and avoid injuring it during anesthesia, which

can be crucial for patients with heart problems.

Latest studies are needed to better understand how dental anesthesia affects people with heart disease, especially those using blood thinners and antiplatelets.

To help dentists treat patients with heart problems before, during, and after dental anesthesia, standardized guidelines should be created.

Ultimately, patient safety comes first. By taking the right precautions, doctors can provide patients with heart conditions with high-quality dental care while reducing the risk of consequences.

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