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Aspirin and oral surgery

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Abstract

Introduction: Acetylsalicylic acid (aspirin, ASA) belongs to nonsteroidal anti-inflammatory drugs group (NSAIDs), characterized by analgesic, antipyretic, anti-inflammatory properties. ASA blocks production of prostaglandins and thromboxanes due to non-competitive irreversible inactivation of cyclooxygenase 1 enzyme (COX1). Nowadays, ASA is most commonly used to inhibit platelet function and to reduce the risk of thrombotic events.

The aim of the study: The purpose of this narrative systemic review was to analyse and summarize available data on necessity of acetylsalicylic acid cessation before oral surgery.

Material and method: Standard criteria were used to review the literature data. The search of articles in the PubMed and Google Scholar databases was carried out using the following key words: acetylsalicylic acid, oral health, oral surgery.

Description of knowledge: According to some medical practitioners dosing acetylsalicylic acid (ASA) before tooth extraction should be stopped because of fear of bleeding complications. However, the cessation of aspirin may predispose patients to thromboembolic events. Most of the data indicates more benefits from continuation aspirin taking than treatment discontinuation.

Summary: According to actual knowledge and conducted researches there is no need to stop dosing aspirin before oral surgery. The benefits of using aspirin are greater than the risk of bleeding.

Key words: acetylsalicylic acid, aspirin, bleeding, oral surgery

Introduction

Aspirin is one of the most common used medicines with analgesic, antipyretic, anti-inflammatory properties [1]. Already more than 2000 years ago it was recommended by Hippocrates to chew willow leaves containing salicylic acid [2]. When preparing for oral surgery there is a few things that patient needs to discuss with a doctor [3]. According to some medical practitioners dosing acetylsalicylic acid (ASA) before tooth extraction should be stopped because of fear of bleeding complications [4]. Aspirin supplementation could prolong bleeding time (BT) and for that reason methods enhancing haemostasis should be used before tooth extraction [5]. Although postoperative bleeding is more common in patients taking aspirin, these differences are not significant [6]. From the other hand this practice can predispose the patient to adverse thromboembolic events [7]. Therefore, discontinuation of the antiplatelet treatment is usually not recommended [8]. According to current knowledge cessation of aspirin before oral surgery is not necessary, because of rare fatal bleeding complications and possibility of control localized bleeding by haemostatic measures also before more invasive surgical procedures [9,10,11,12].

There is some evidence, that dental surgery procedures could be also safe for patients on uninterrupted dual antiplatelet treatment. Such patients are at higher risk of bleeding but the bleeding could be well controlled [13,14,15]. However, it should not be forgotten that patients always have to be consulted before dental surgical treatments and decision about further treatment should be made individually [16].

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Description of knowledge

Acetylsalicylic acid – basic information.

Acetylsalicylic acid is an irreversible inhibitor of cyclooxygenase, which works almost exclusively on COX-1. It is used in various doses that shows different properties of NSAIDs group (nonsteroidal anti-inflammatory drugs) like as analgesic, antipyretic and anti-inflammatory. Nevertheless, aspirin as an anti-inflammatory drug is no longer used because of side effects of gastrointestinal tract, nephrotoxicity, ototoxicity and aspirin-induced asthma. Likewise it is not recommended to use ASA in antipyretic property in viral diseases because of the risk of developing Reye syndrome [17].

Clinical studies of acetylsalicylic acid in oral doses of in general 0.3 to 1.0 g have shown efficacy for the relief of acute, mild to moderate pain, such as tension-type headache, migraine headache, dental pain, sore throat etc. Considering analgesic, antipyretic and anti-inflammatory properties, it is unjustified to use aspirin in long term practice [17].

Acetylsalicylic acid also inhibits platelet aggregation by blocking thromboxane A₂ synthesis in platelets. It significantly reduces the mortality and incidence of heart attacks among patients with unstable ischemic heart disease, as well as the mortality and frequency of reinfarction in patients with a history of myocardial infarction. According to literature also small doses of aspirin can reduce occurrence of ischemic strokes and transient ischemic attack (TIA). Thus, it is used for various vascular indications at doses of in general 75 to 300 mg daily. In those doses, aspirin is safe, effective and relatively affordable that it became a gold standard of antiaggregatory treatment [17].

Acetylsalicylic acid is a weak acid and it is administered *per os*. Aspirin is absorbed in the stomach and in the upper small intestine. The increased pH and larger surface area causes aspirin to be absorbed more slowly in the rest of the gastrointestinal tract. Various factors may affect the rate of absorption of the medicine. These include the physicochemical properties, the surface area of the tract, the pH of the gastrointestinal lumen, intestinal transit times and the rate of gastric emptying. In empty stomach, solutions of aspirin salts are absorbed quite quickly in human. Aspirin is also absorbed slowly from the skin, and it appears to be usefully applied to the skin in the treatment of herpes zoster and post-herpetic neuralgia, although further evaluation is required. The very low levels of aspirin in blood resulting from cutaneous application are still sufficient to reduce prostaglandin synthesis in the gastrointestinal tract with consequent gastric damage [18].

Aspirin is widely distributed throughout the body, although most of it is bounded to plasma proteins and less to tissue constituents. The binding to plasma albumin has been proven only in small detail [18].

Elimination of aspirin occurs through hydrolysis to salicylates. Enzymatic hydrolysis of aspirin takes place in variety of tissues, mostly in liver, but also at gastrointestinal tract, kidney, hind limbs and blood. This process is rapid and because of it, only small amounts of medicine are excreted unchanged in urine. Main part is eliminated in urine as salicylate and its further metabolites [18].

Aspirin continuation or discontinuation before the oral surgery.

Many of dental patients are taking a low dose of aspirin as a preventive treatment for cardiovascular disease for a long term. Because of the high risk of intra- and postoperative bleeding impossible to control, doctors tend to discontinue aspirin intake seven to ten days before dental surgery. However, given the actual literature and controlled researches there is no reasonable grounds for such a practice. Furthermore, these actions may increase risk of developing thromboembolism, myocardial infarction or cerebrovascular accident. Based on the researches, it can be stated that taking small doses of aspirin does not significantly increase the intra- and postoperative bleeding [1,19].

Ardekian et al. conducted study on 39 persons, that were on a long term aspirin therapy and were scheduled to undergo dental extractions. Objects were randomly divided into two groups: experimental and control. In the experimental group, patients kept continuing the therapy, while patients in the control group stopped receiving aspirin seven days before surgery and resumed treatment the day after dental procedure. Different surgical procedures were conducted on those objects such as simple extraction, extraction of a few teeth without raising a mucoperiosteal flap and with only minor alveoplasty. Complex surgical procedures involved raising the mucoperiosteal flap and removing large amounts of bone before performing the extraction. Patients with anaemia, receiving sodium warfarin therapy or other anticoagulant therapy were excluded from the study. Scientists observed that main bleeding time was 1.8 +/- 0.47 minutes for patients who stopped aspirin therapy for one week before the dental procedure. Patients who continued the ASA therapy, bleeding time ranged 3.1 +/- 0.65 minutes. Although the difference between two groups was significantly large, the results were within the normal bleeding time range. Additionally most of the intraoperative bleeding was easily controlled with suturing, and local haemostasis achieved by direct pressure with gauze. Only four patients from the test group and two from control group needed tranexamic acid, an antifibrotic agent to stop the oozing from the extraction wound [19].

Similar research was conducted by Nasser Nooh. It was performed on 189 people. Objects were divided into two separate groups. First of them was using ASA 81mg orally once a day for the previous 6 months. The second one was a control group and did not received ASA. Similarly to Adrekian's reaserch, people with anaemia, liver disease or any medical condition which might affect the coagulation process and subjects with a history of bleeding episodes or epistaxis, subjects suffering from any psychiatric diseases were excluded. Again various dental procedures were conducted on both groups: simple and surgical extraction. According to Nasser's research, only in one group where objects were receiving ASA and underwent surgical extraction appeared bleeding after 24 hours. However, all groups had the same results after 48 hours and five days after surgical procedure. Increased prolonged bleeding was controlled by local haemostatic measures [1].

Patients with an aspirin therapy prescribed, are generally more likely to be a high-risk patients and have a chronic diseases. Conversely patients not using aspirin are statistically healthier. That makes a question whether the increased bleeding risk could be caused by

combination of continuation of aspirin therapy with a high-risk conditions or suffering chronic diseases. Because of these doubts Chanapong Rojanaworarit and Soontaree Limsawan conducted research that compares patients taking aspirin and those who has never taken aspirin. Patients in the aspirin group were older, had diabetes, hypertension, cardiovascular disease or survived a stroke. Patients in non-aspirin group were generally healthier. However, this differences did not have any effects on the study. According to the research, people receiving aspirin are more exposed to higher risk of haemorrhage during the chirurgical procedure. Nonetheless, the bleeding complication wasn't fatal and could be easily managed by using haemostatic measures [20].

Conclusion

ASA is mostly used in prevention of cardiovascular and cerebrovascular events, due to inhibition of platelet function. Discontinuation of aspirin treatment may result in increased risk of thrombotic events and can be fatal for patients. The practice of discontinuing aspirin intake during chirurgical procedure has been slowly shifted towards accepting the continuation of the drug. In the longer term, all doctors should aim to provide the same care to the patients taking aspirin as to those who are health. According to actual knowledge and conducted researches there is no need to stop dosing aspirin before oral surgery. The benefits of using aspirin are greater than the risk of bleeding, which is not fatal and can be easily controlled with a local haemostatic measures.

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