International Journal of **Health Science**

DENTAL CONDUCT TO REDUCE BLEEDING PROCESSES IN PATIENTS USING ANTICOAGULANT AND PLATELET ANTIAGREGANT

Rodolfo Freitas Dantas
Dental Surgeon by: Centro Universitário UNIPE
Medicine Student at Centro Universitário UNIPE
Professor at: Centro Universitário UNIESP
João Pessoa - PB
http://lattes.cnpq.br/6892678914894326

Manoelly Anyelle Pessoa Dias Dantas
Bachelor of Laws at Centro Universitário UNIPE
Dental Surgeon by: Centro Universitário UNIESP
Radiologist, Pediatric Dentist and Collective Health by UNIBF
João Pessoa - PB
http://lattes.cnpq.br/5572232700153985

Manoel de Oliveira Dantas Filho
Oral and maxillofacial surgeon
João Pessoa - PB

Halyff Kleiton de Lima Clementino
Dental Surgeon by: Centro Universitário UNIESP
João Pessoa - PB

Nathan Carlos de Souza Gonçalves
Dentistry student at: Centro Universitário UNIESP
João Pessoa - PB

Jonaths Cruz Andrade
Dentistry student at: Escola Superior Da
Amazônia
Belém - PA
https://lattes.cnpq.br/3295594029579724

Kamilla Covas
Dental Surgeon by: Centro Universitário das
Faculdades Metropolitanas Unidas - FMU
São Paulo - SP
http://lattes.cnpq.br/1136298886523848

José Cirilo da Fonseca Neto
Oral and Maxillofacial Surgeon at Hospital
Meridional
Cariacica - ES
http://lattes.cnpq.br/6555467420650982

Nery José de Oliveira Junior
Dentistry student at: Atitus Educação
Porto Alegre - RS
http://lattes.cnpq.br/6361340364169624

Joyce Raianne Santos Sá
Dentistry student at: Universidade Federal de
Campina Grande - PB
Campina Grande - PB
http://lattes.cnpq.br/2955219068762705

Sophia Leite Rangel de Pontes
A Dentistry student at: Unipe-PB

Abstract: Patients with systemic alterations require greater attention and individualized treatment, in dentistry this is no different, attention to comorbidities and medications used by patients is of paramount importance. Therefore, this work aims to address the importance of the changes that anticoagulants and antiplatelet agents cause in the body and to relate the conduct that the dental surgeon must take in procedures performed with patients who undergo some antithrombotic therapy, also addressing the new anticoagulants. For this, the electronic databases of Google Scholar and Scielo were used. Based on the consulted studies, it was possible to conclude that the suspension of these drugs is not recommended, making clear the importance of a good anamnesis and complementary exams to avoid probable surgical complications related to the formation of thrombi or hemorrhages, also pointing out the importance of the use of local hemostatics if necessary.
Keywords: Platelet antiaggregants, Anticoagulants, Factor Xa Inhibitors and New anticoagulants.

INTRODUCTION

The coagulation cascade has a component that plays a fundamental role in its activation, factor X, which is a plasmatic glycoprotein, dependent on vitamin K, which is synthesized in the liver, important in the extrinsic and intrinsic pathways.

The partial or total deficit of factor X compromises the formation of the clot that can lead the patient to a hemorrhagic condition manifesting symptoms of severity that can vary (FERREIRA et al., 2022).

An individualized diagnosis is important to identify vitamin K deficiency or acquired deficiency, which occurs more frequently among the elderly. Defining the type of deficiency classification is important to

understand the complexity of the patient, the simultaneous decrease in factor X and plasma antigen levels that signals Type I deficiency, which in most cases is caused by a defect in the synthesis of glycoprotein or suppression of protein secretion. Regular or reduced release of non-functioning factor X indicates type II deficiency (FERREIRA et al., 2022).

Platelets, coagulation proteins, vessels, the fibrinolysis system and natural anticoagulants create the balance of hemostasis that is guaranteed by these different mechanisms, with more complex cellular responses, interrelation of proteins and uniformity of blood flow (Franco, 2001).

The anticoagulant is indicated in cases that have a greater propensity for the formation of thrombi in the bloodstream, this medication will prevent their formation, as a consequence, there is a limitation in the healing of incisions and wounds (BARBOSA et al., 2020). The importance of preoperative control in patients undergoing antithrombotic therapy is great, since alterations can cause complications during dental procedures, becoming a challenging problem for the professional, transforming the suspension of drug therapy into a risk for the patient (DIAS, 2012)

GOAL

GENERAL GOAL

Explain the importance of the changes that anticoagulants and antiplatelet agents cause in the body and relate it to dental management.

SPECIFIC GOALS

- Address surgical protocols developed for patients using anticoagulants.
- Report probable problems of patients who are prone to thrombus formation.
- Investigate the difficulty of surgical procedures in patients using anticoagulants and antiplatelet agents.

REVIEW OF LITERATURE

METHODOLOGY

The methodological course of this work consisted in carrying out a narrative review of the literature related to the proposed theme. For this issue, the electronic databases of Google Scholar and Scielo were used in the period from 2001 to 2022, using the descriptors: "Inhibitors of Platelet Aggregation" (Platelet Aggregation Inhibitors), "Anticoagulants" (Anticoagulants) and "Inhibitors of Factor Xa" (Factor Xa Inhibitors) After that, 16 articles were obtained, of which, after appreciation, 9 were selected, using only articles in Portuguese and English as a selection criterion.

PLATELET ANTIAGGREGANTS

Platelets, coagulation proteins, vessels, the fibrinolysis system and natural anticoagulants create the balance of hemostasis that is guaranteed by these different mechanisms, with more complex cellular responses, interrelation of proteins and uniformity of blood flow (Franco, 2001).

One of the main characteristics of platelet antiaggregants is to promote the inhibition of the formation of tumbles without significantly interfering in other coagulation segments. The inhibition provided by antiaggregants will interfere with platelet functions, preventing adhesion and aggregation, preventing the release or secretion of platelets, decreasing circulating platelet aggregates, thus avoiding thrombus formation, which is predominantly platelet-induced (Oliveira, 2001).

The platelet functions of ASA were discovered around 1960, being the best known antiaggregant and most used in antithrombotic treatments today. An analysis of approximately 50 studies concluded that this drug is capable of reducing mortality by 15% in fatal vascular events and by up to 30% in non-fatal cases. The platelet functions

of ASA were discovered around 1960. The drug showed greater effectiveness in patients with stable angina, surgical myocardial revascularization, prophylaxis of thrombi in patients undergoing hemodialysis for a long time, acute myocardial infarction, transient cerebral ischemia and stroke, considerably reducing the rate of mortality or recurrence (Oliveira, 2001).

MECHANISM OF ACTION OF ANTIPLATELET AGENTS

The antiplatelet agents will have different types of action, the arachidonic acid pathway will alter the phospholipids of the platelet membrane that will become omega fatty acids, they will also act as phospholipase A2 and cylooxygenase inhibitors with triflusal aspirin, also inhibiting the tomboxane synthetase and TXA2 and PGH2 receptor antagonists. Adenylate cyclase will be stimulated and there will also be an inhibition of phosphodiesterase which will be related to the increase in platelet cyclic AMP (Oliveira, 2001).

The main mechanism of action of acetylsalicylic acid is the irreversible interruption of the function of cyclooxygenase isoenzymes, COX 1 which will act on platelets, stomach and kidney, while COX 2 acts on the central nervous system, trachea, kidney endothelial cells and other sites, leading to the transformation of arachidonic acid into PGH2, which is the predecessor of PGD2, PGE2, PGF2a, PGI2 and TXA2, providing for the eventual interruption of production of thromboxane A2 (Oliveira, 2001).

ANTICOAGULANT

Coagulation is divided into an extrinsic pathway that comprises not only the blood but also components that are not in the intravascular space and an intrinsic pathway that is activated by components that are inside the vessels, found in the activation of factor X (Franco, 2001).

The vascular endothelial injury is what will activate the extrinsic pathway of coagulation, releasing tissue thromboplastin which is factor III, which with the prothrombin accelerator (factor VII) combined in the presence of calcium will activate factor X which is the main anti-inflammatory factor. hemophiliac. In the intrinsic mode, the activation of factor X is made possible by contact with any surface other than the endothelium of the vascular tissue, activating factor XII, which is the precursor of factors IX and VIII, together with calcium and platelet phospholipid, which will act directly on factor X to activate it (FERNANDES et al., 2016).

The fibrin clot formed in the endothelial lesion indicates activity to maintain vascular integrity. This process involves local hemostasis, which are regulated at the same time, trying to avoid maximum blood loss and preventing the emergence of intravascular thrombi, resulting from excess fibrin formation (Franco, 2001). The clot adapts to the wound, interrupting blood and fluid loss, preventing the penetration of external agents, serving as a temporary alternative for wound organization. Macrophages and neutrophils are recruited to excrete specific factors that control the tissue repair process (OLIVEIRA; DIAS., 2012).

Warfarin and phenprocoumon are vitamin K antagonist drugs, they were accidentally discovered in the 30s. Currently, they are widely used in patients with heart diseases to prevent and treat thromboembolic events. Research shows that the use of these vitamin K antagonist drugs in patients with venous thromboembolic disease reduces the chances of deep venous thrombosis, also avoiding this complication in patients with heart valves, also reducing the possibility of thromboembolism in patients with arterial fibrillation, which in turn has 17.5 times more likely to have

it compared to people without cardiac arrhythmia (MOLINA; JUNIOR., 2014).

Dabigatran a direct prothrombin inhibitor and the first new anticoagulant to have systemic action analyzed as a treatment for venous thromboembolism, it is administered orally. This medication can cause problems with poor intake or changes in sensitivity in the stomach lining. Dabigatran proved to be very effective according to initial data on research related to the drug, proving to be as safe as traditional treatments for venous thromboembolism, especially in the prolonged period. Other new anticoagulants such as Rivaroxaban, Apixaban, Edoxaban are also being studied and with satisfactory results compared to warfarin, proving to be more effective with regard to bleeding, with greater effectiveness than warfarin in these cases, in addition to a lower recurrence of venous thromboembolism being an interesting alternative for patients (FERNANDES et al., 2016).

MECHANISM OF ACTION OF THE ANTICOAGULANT

Oral anticoagulants are antagonists of vitamin K, which is essential for the activation of coagulation factors, and proteins C and S. Active vitamin K will bind to these factors, initiating the activation of blood clotting (FERNANDES et al., 2016).

Blocking the cyclic conversion of vitamin K is one of the functions of warfarin, preventing the initiation of clotting events by also blocking its 2,3 apoxide, interfering with factors II, VII, IX and X, thus preventing the cycle of the coagulation cascade until the body metabolizes them (MOLINA; JUNIOR., 2014).

SHELF LIFE OF ANTIAGGREGANTS AND ANTICOAGULANTS

Antiaggregants have a reduced plasma half-life of up to 20 minutes, aggregating platelets with an effect that lasts up to 10 days, which is the time platelets remain in the bloodstream until platelet renewal occurs. Absorption has increasing speed in aqueous solutions, with capsules coated with methylcellulose (Oliveira, 2001).

The half-life of warfarin ranges from 36 to 72 hours with an effect that can last up to 7 days. Dabigatran, on the other hand, has a shorter half-life, between 12 and 17 hours, and the time of effect of this drug varies depending on the dose administered to the patient (FERNANDES et al., 2016).

EVALUATION OF HEMATOLOGICAL CHANGES OF ANTIPLATELET AGENTS AND ANTICOAGULANTS

The International Normed Index (INR) is a test that calculates the prothrombin time and averages the normal range of clotting. The resultant value of the test is multiplied by the International Sensitivity Index (ISI), which will generate an evaluation of the amount of thromboplastin response, compared with the reference value of the exam (OLIVEIRA; DIAS., 2012).

It is extremely important to request complementary exams for a good follow-up of the patient. Exams such as the coagulogram that will identify the bleeding time, clotting time, active partial prothrombin time, active prothrombin time and the INR. In patients without systemic alterations related to blood clotting, the reference value of the INR is 1, the lower the level of coagulation, the higher the value of the Index (OLIVEIRA; DIAS., 2012).

According to the WHO recommendation, performing more invasive dental procedures can be performed as long as the patient's INR

is at a maximum value of 3.5 for extractions of up to three dental elements or installation of up to three implants. If the INR is above 5, it is not recommended to perform any surgical procedure, being advised to contact the doctor responsible for the patient for analysis and planning of the best form of treatment for the patient (GERZSON et al., 2016).

DENTAL CONDUCT

Drug therapy to prevent thrombus formation is critical for patients who are at the highest risk of thrombus formation in the bloodstream. The prevention of thromboembolic episodes with drugs that affect hemostasis has hemorrhage as an adverse effect, requiring increased attention from the dentist in the daily care of these patients (CAVEZZI, 2016). Patients with systemic problems require greater knowledge and responsibility, having to perform routine consultations more frequently. Anticoagulants and antiplatelet agents are becoming more common in preventive treatments against thrombus formation in patients with ischemic heart disease, heart valve implants, stents and in people with cerebrovascular diseases (GERZSON et al., 2016).

The hemostasis phase depends on the coagulation cascade and platelet activity, starting after injury. As soon as the tissue is damaged, the endothelial cells undergo changes, the extravasation of blood vessels after the rupture initiates the promotion of immediate vasoconstriction, aiming to minimize blood loss (Pristo, 2012). In daily practice in dental offices, it is common for some professionals, due to insecurity, to request a break or change of antithrombotic medication, fear of excessive bleeding during and after surgical procedures, and often pause the medication without consulting the doctor in charge (GERZSON et al., 2016).

DISCUSSION

Fernandes et al. (2016) talks about the suspension of anticoagulants in the class of new anticoagulants, he considers that if surgery is elective, it is important to consider the half-life of the drug so that there is a safe suspension for a period that is not less than 24 hours. In the case of emergency surgery, an antidote can be used since the patient may still have the active drug in the bloodstream, preventing the activation of the coagulation cascade. The return to use of this measurement must be viewed with caution, taking into consideration, the risks of potential postoperative bleeding and a possible thromboembolic phenomenon.

Gerzson (2016) states that, however small it may be, there is the possibility that the patient will experience a thromboembolic event when the drug is suspended, which can be fatal for the patient and also shows that even with the risk of the patient, the patient is exposed to a possible hemorrhagic process, can be controlled with local hemostatic measures, not exposing him to a risk of thrombosis.

Dantas et al. (2009) states that in the case of patients who use anticoagulant and platelet antiaggregant drugs and who need to undergo dental treatment, it is of great importance that an appropriate planning is carried out, which contains a broad analysis of the patient's systemic condition, control the level of coagulation through laboratory tests, evaluation and classification of the trauma and the dimension of the procedure to be performed; and that provides guidance on the procedure in association with the drug used and local hemostatic.

Dias (2012) complements by saying that there are several types of antithrombotic therapies with different purposes, emphasizing that surgical procedures have different characteristics requiring meticulous planning to reduce likely complications, therefore, it is

extremely important that the dental surgeon consults the doctor responsible for the patient to seek the best form of treatment taking into account the type of procedure and duration, defining a safe INR value for carrying out the dental procedure.

Molina and Junior (2014) rectify the importance of comprehensive follow-up with the patient, seeing the variables that can influence both procedures and the function of the medication used, variables such as age, diet or even other medications used are taken into consideration, for satisfactory planning and that brings more comfort to the patient at the time of the procedure.

FINAL CONSIDERATIONS

Dental management to reduce bleeding processes in patients who use anticoagulants and antiplatelet agents are: detailed anamnesis; request for complementary exams, such as radiographs and hematological exams; use of local hemostatics; excellent surgical technique and suturing.

The most common complications arising from dental surgical procedures are bleeding at the time of the procedure, in cases of patients using antiplatelet agents, and late hemorrhagic processes in patients using anticoagulants.

As a pre-surgical procedure, the suspension of platelet antiaggregants and anticoagulants is not recommended.

REFERENCES

DANTAS, A.K.; DEBONI, M.C.Z.; PIRATININGA, J.L. Cirurgias odontológicas em usuários de anticoagulantes orais **Rev Bra Hematol Hemoter**, 31, pp. 337-340 (2009).

DIAS, B. S. B. **Avaliação do risco de hemorragia em pacientes submetidos à cirurgia bucal fazendo uso contínuo de anticoagulante oral, sem alterar o regime terapêutico:** um estudo clínico**.** Universidade do Estado do Rio de Janeiro 2012.

FERNANDES, C. J. C. S.; *et al.*, Os novos anticoagulantes no tratamento do tromboembolismo venoso. **Jornal Brasileiro de Pneumologia**, v. 42, p. 146-154, 2016.

FERREIRA, C. I. et al., Estratégia anestésica em coagulopatia de deficiência de fator X: relato de caso. **Brazilian Journal of Anesthesiology**, v. 72, n. 6, p. 816-818, 2022.

FRANCO, R. F. Fisiologia da coagulação, anticoagulação e fibrinólise. **Medicina (Ribeirão Preto)** 34.3/4: 229-237.(2001).

GERZSON, A, S.; *et al.* Cirurgias odontológicas em pacientes sob terapia com antiagregante plaquetário e anticoagulante oral: revisão de literatura. **Journal of Clinical Dentistry & Research**, v. 13, n. 2, 2016.

MOLINA, F. T.; JÚNIOR, G. Z. Anticoagulantes cumarínicos: ações, riscos e monitoramento da terapêutica. **SaBios-Revista de Saúde e Biologia**, v. 9, n. 2, p. 75-82, 2014.

OLIVEIRA, G. M. M. Antiagregantes plaquetários. **Rev SOCERJ, Rio de Janeiro**, v. 14, n. 1, p. 21-27, 2001.

OLIVEIRA, I. V. P. M.; DIAS, R. V. C. Cicatrização de feridas: fases e fatores de influência. **Acta Veterinária Brasilica**, v. 6, n. 4, p. 267-271, 2012.