

Safety and Effectiveness of a Protocol for Dental Care of Anticoagulated Patients at a Hospital Level

Segurança e Efetividade de um Protocolo para Atendimento Odontológico de Pacientes Anticoagulados em Nível Hospitalar
Seguridad y Eficacia de un Protocolo para la Atención Odontológica de Pacientes Anticoagulados a Nivel Hospitalario

RESUMO

Introdução: A terapia anticoagulante é essencial para prevenir eventos tromboembólicos em pacientes com distúrbios cardiovasculares, mas aumenta o risco de complicações hemorrágicas em procedimentos odontológicos. Protocolos de manejo variam entre manutenção, ajuste ou suspensão dos anticoagulantes, aliados ao uso de hemostáticos locais para mitigar esses riscos. **Objetivo:** Avaliar a efetividade de um protocolo para a execução de procedimentos odontológicos, com potencial sangramento, em pacientes anticoagulados. Esse protocolo foi idealizado e é proposto pela Secretaria Municipal de Saúde de Belo Horizonte, Minas Gerais – SMSA/PBH, para atendimentos realizados em sua rede de atenção à saúde.

Metodologia: Trata-se de um estudo quantitativo retrospectivo da análise dos prontuários dos pacientes atendidos pelo Serviço Especial de Diagnóstico e Tratamento em Odontologia (SEDTO) do Hospital das Clínicas da Universidade Federal de Minas Gerais (HC-UFGM), em nível ambulatorial, no período de outubro de 2020 a novembro de 2023, conforme solicitações médicas. **Resultados:** Foram avaliados 174 prontuários de pacientes em uso de anticoagulante oral, nos quais 292 procedimentos foram realizados e 8 casos de complicações hemorrágicas foram observados. **Conclusão:** O protocolo para atendimento de pacientes anticoagulados, disponibilizado pela PBH, é efetivo e viabiliza a realização de procedimentos odontológicos com segurança nesse público. Para executar o manejo odontológico de pacientes que fazem uso de anticoagulantes, é imprescindível realizar um planejamento criterioso, sempre respeitando a individualidade e a necessidade de cada paciente.

PALAVRAS-CHAVE: Anticoagulantes. Tratamento odontológico. Hemorragias.

ABSTRACT

Introduction: Anticoagulant therapy is essential to prevent thromboembolic events in patients with cardiovascular disorders, but it increases the risk of hemorrhagic complications during dental procedures. Management protocols vary between maintaining, adjusting, or suspending anticoagulants, combined with the use of local hemostatics to mitigate these risks. **Objective:** To evaluate the effectiveness of a protocol for performing dental procedures with potential bleeding in anticoagulated patients. This protocol was developed and is proposed by the Municipal Health Department of Belo Horizonte, Minas Gerais – SMSA/PBH, for procedures carried out in its healthcare network. **Methodology:** This is a retrospective quantitative study based on the analysis of medical records of patients treated by the Special Dental Diagnosis and Treatment Service (SEDTO) of the Clinics Hospital at the Federal University of Minas Gerais (HC-UFGM), on an outpatient basis, from October 2020 to November 2023, according to medical requests. **Results:** A total of 174 medical records of patients using oral anticoagulants were evaluated, in which 292 procedures were performed and 8 cases of hemorrhagic complications were observed. **Conclusion:** The protocol for the care of anticoagulated patients provided by PBH is effective and enables safe dental procedures for this population. To manage anticoagulated patients in dentistry, thorough planning is essential, always respecting each patient's individuality and needs.

KEYWORDS: Anticoagulants. Dental treatment. Hemorrhages.

RESUMEN

Introducción: La terapia anticoagulante es esencial para prevenir eventos tromboembólicos en pacientes con trastornos cardiovasculares, pero aumenta el riesgo de complicaciones hemorrágicas durante los pro-

cedimientos odontológicos. Los protocolos de manejo varían entre mantener, ajustar o suspender los anticoagulantes, combinados con el uso de hemostáticos locales para mitigar estos riesgos. **Objetivo:** Evaluar la efectividad de un protocolo para la realización de procedimientos odontológicos con potencial de sangrado en pacientes anticoagulados. Este protocolo fue idealizado y es propuesto por la Secretaría Municipal de Salud de Belo Horizonte, Minas Gerais – SMSA/PBH, para la atención en su red de salud. **Metodología:** Se trata de un estudio cuantitativo retrospectivo basado en el análisis de los historiales clínicos de pacientes atendidos por el Servicio Especial de Diagnóstico y Tratamiento Odontológico (SEDTO) del Hospital de Clínicas de la Universidad Federal de Minas Gerais (HC-UFMG), en el ámbito ambulatorio, en el período de octubre de 2020 a noviembre de 2023, según solicitudes médicas. **Resultados:** Se evaluaron 174 historiales clínicos de pacientes en uso de anticoagulantes orales, en los cuales se realizaron 292 procedimientos y se observaron 8 casos de complicaciones hemorrágicas. **Conclusión:** El protocolo para la atención de pacientes anticoagulados, ofrecido por la PBH, es efectivo y permite la realización segura de procedimientos odontológicos en esta población. Para el manejo odontológico de pacientes anticoagulados, es imprescindible una planificación rigurosa, respetando siempre la individualidad y las necesidades de cada paciente. **PALABRAS CLAVE:** Anticoagulantes. Tratamiento odontológico. Hemorragias.

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INTRODUCTION

In recent years, the use of oral anticoagulants has been widely used in clinical practice for the prevention and treatment of thromboembolic events in patients with conditions such as atrial fibrillation, heart valve prostheses and venous thromboembolisms^{1,2}. In addition, these drugs can be classified according to their route of administration, into oral (warfarin and specific target) or parenteral (heparin sodium and its derivatives³).

Among oral anticoagulants, warfarin, a vitamin K antagonist (VKA), has traditionally been the most widely used drug for long-term anticoagulation. However, the need for frequent monitoring of coagulation levels, constant dose adjustments, low therapeutic index, delayed onset of action and the high potential for drug interactions have driven the development of target-specific oral anticoagulants, also known as DOACs - Direct Oral Anticoagulants^{4,5,6}.

In this context, DOACs, including dabigatran (Pradaxa®), which is a direct thrombin inhibitor, and factor Xa inhibitors such as rivaroxaban (Xarelto®), apixaban (Eliquis®) and edoxaban (Lixiana®), have advantages over warfarin. These advantages include a more predictable safety profile, lower monitoring requirements, immediate action and a short half-life^{7,8}.

However, despite this, both warfarin and DOACs are drugs that interfere with the mechanism of hemostasis. This implies an increased risk of hemorrhagic complications, especially in contexts where hemostasis is critical, such as during and after dental procedures⁹. In clinical dental practice, this idea takes on particular importance, given that, for anticoagulated patients, some procedures, such as tooth extractions and periodontal treatments, can cause bleeding¹⁰.

In addition, studies have shown that many dental surgeons have a low

level of knowledge about how to approach patients who use anticoagulants, adopting mistaken behaviors and/or showing a lack of experience with this management¹¹.

Care protocols have therefore been suggested. These protocols range from completely stopping the drug, reducing it or replacing it with heparin, to maintaining anticoagulant therapy, with an emphasis on the use of local hemostatics¹². However, despite this, the variability in the interpretation of guidelines and the lack of consensus on the management of anticoagulants can affect the approach and safety of procedures, demonstrating that this management is still a challenge in dental practice¹³. Given this complexity and the risks associated with hemorrhagic complications during dental procedures in patients taking anticoagulants, the dental surgeon must be adequately prepared to manage these cases.

In this context, considering the international guidelines for maintaining anticoagulant therapy during dental treatment¹⁴, the city of Belo Horizonte (PBH), in Minas Gerais - Brazil, has established a specific protocol for the dental management of anticoagulated patients¹⁵. The Special Service for Diagnosis and Treatment in Dentistry (SEDTO) of the Hospital das Clínicas of the Federal University of Minas Gerais (HC-UFGM), which is part of the health care network of the PBH, at tertiary level, and receives patients through the regulation system for care in a hospital environment, including those on anticoagulation, adopted and began to follow these recommendations.

In view of this, the aim of this study was to analyze the safety and effectiveness of the protocol implemented by PBH in the dental management of anticoagulated patients. In particular, we sought to assess the applicability of this protocol in dental procedures with the potential to cause bleeding,

performed in a hospital dental service, considering its ability to minimize risks and ensure favorable clinical outcomes.

METHODOLOGY

This retrospective quantitative study analyzed the medical records of patients from HC-UFGM, treated by SEDTO, on an outpatient basis, from October 2020 to November 2023, according to medical requests.

The data was collected in accordance with National Health Council Resolution 466 of December 12, 2012, and the study was previously approved by the UFGM Research Ethics Committee (COEP) with approval number 1.222.370 (Certificate of Submission for Ethical Appraisal - CAAE number: 48122215.4.0000.5149). The Informed Consent Form (ICF) was waived due to the analysis of data from medical records, making individualized consent impossible.

The protocol used by SEDTO-HC UFGM was based on the recommendations of the PBH Outpatient Anticoagulation Protocol, which guided the management of patients on anticoagulant therapy undergoing procedures with bleeding potential. The main measures recommended include requesting a medical assessment to verify the suspension or maintenance of the anticoagulant, requesting the International Normalized Ratio (INR) value, preferably collected up to 24 hours before the procedure, and taking into account the extent and complexity of the procedure. In addition, they advise individual assessment of each case, referral when necessary, the use of anaesthetics with vasoconstrictors, minimizing surgical trauma, scheduling a greater number of appointments and planning appointments for the beginning of the week.

Medical records of patients who underwent minor oral surgery and

periodontal scraping procedures while taking anticoagulants during the period described were analyzed. The inclusion criteria involved the medical records of patients who underwent these procedures while on anticoagulant therapy, while the exclusion criteria included medical records with incomplete data. Patients' socio-economic data (age and gender), clinical information such as the indication for anticoagulant therapy, medication in use and the pre-surgical INR value were recorded, as well as the number and type of procedures carried out and the number of teeth extracted.

The indications for anticoagulant therapy included conditions such as atrial fibrillation, metallic or biological valve prostheses (aortic and/or mitral), venous thromboembolism, deep vein thrombosis, pulmonary thromboembolism, ischemic stroke, rheumatic heart disease, chagasic heart disease, among other specific conditions that justified the use of anticoagulant medication, even if they were not identified in detail. All the patients who underwent treatment had INRs within therapeutic levels for the required medical management, with values of up to ^{3,5}.

The anticoagulant medications included in the analysis were: direct oral anticoagulants (warfarin); warfarin associated with acetylsalicylic acid (ASA); targeted oral anticoagulants, including rivaroxaban, apixaban and dabigatran; and targeted anticoagulants associated with ASA. The procedures performed were classified as alveolar extractions, non-alveolar extractions (with surgical flap and osteotomy) and periodontal scraping.

The previous history of bleeding in previous procedures was collected and the incidences of trans- and post-operative bleeding were analyzed. Trans-operative complications were classified as increased bleeding with or without hemostasis, while post-operative complications included reports

of bleeding by telephone, return to the service complaining of bleeding, need for hospitalization with or without blood transfusion, and episodes reported by patients without seeking medical attention.

Finally, the data obtained was analyzed by means of a descriptive study, using absolute and relative percentages. The information from the medical records was collected and organized by a researcher and tabulated in spreadsheets for later descriptive analysis.

RESULTS

Of the 174 medical records analyzed, the patients ranged in age from 7 to 83 years, with a predominance of females (60.92%). Among the diagnoses recorded, up to three different conditions were identified per patient that justified the use of anticoagulants, totaling 256 diagnoses. Among these conditions, atrial fibrillation

was the most prevalent, accounting for 31.6% of the total, standing out as the main indication for anticoagulant therapy in this sample.

With regard to the dental procedures carried out, 292 different procedures were documented among the patients studied. Most of these procedures consisted of alveolar extractions (40.07%) and supragingival scraping (50.00%).

Among the individuals included in the study and taking anticoagulants, 98 (56.32%) used warfarin; 28 (16.09%) used warfarin associated with acetylsalicylic acid (ASA); 45 (25.86%) used targeted anticoagulants such as rivaroxaban, apixaban or dabigatran; and 3 (1.72%) used targeted anticoagulants associated with ASA.

Table1 - Characterization of the sample

	N (%)
Sex	
Female	106 (60,92)
Male	68 (39,08)
Age	
0 - 9	1 (0,57)
10 - 19	1 (0,57)
20 - 29	2 (1,15)
30 - 39	5 (2,87)
40 - 49	34 (19,54)
50 - 59	56 (32,18)
60 - 69	51 (29,31)
70 - 79	18 (10,34)
80 - 89	6 (3,45)

Original Article

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Diagnosis	
FA	55 (31,61)
Metal prosthesis	37 (21,26)
VTE (DVT)	33 (18,97)
AVEi	31 (17,82)
Rheumatic heart disease	26 (14,94)
TEP	14 (8,05)
Transplant	10 (5,75)
Biological prosthesis	9 (5,17)
Chagasic heart disease	8 (5,60)
Others	33 (18,97)
Procedures	
Supragingival scraping	146 (50,00)
Alveolar exodontia	117 (40,07)
Non-alveolar exodontia	16 (5,48)
Super and subgingival scraping	7 (2,40)
Subgingival scraping	2 (0,68)
Other (biopsy; bone repair)	4 (1,37)
Medicines	
Warfarin	98 (56,32)
Specific target	45 (25,86)
Warfarin + ASS	28 (16,09)
Specific target + ASS	3 (1,72)

*It was not possible to identify the systemic condition that led to the use of the anticoagulant.

Among the anticoagulated patients, only 8 (4.60%) had complications, of which 3 (37.50%) were related to the transoperative period and 5 (62.50%) to the postoperative period.

The complications reported were related to the alveolar extraction procedure and supragingival scraping. Of the 117 alveolar extractions carried out, 3 (2.56%) had trans-operative complications and 4 (3.42%) had post-operative

complications. Of the 146 supragingival scrapings, only 1 (0.68%) post-operative complication was reported.

Among the patients using warfarin (N=98), 1 (1.02%) had a trans-operative complication which was resolved after hemostasis interventions, and 1 (1.02%) had a post-operative complication but did not seek treatment. Of the patients using warfarin combined with acetylsalicylic acid (ASA) (N=28), 1 (3.58%) had increased bleeding during the procedure, which was controlled by local hemostasis maneuvers, and 3 (10.71%)

had post-operative complications. Of these, 1 (3.58%) did not seek care, while 2 (7.14%) returned to the outpatient department, where the bleeding was controlled with local measures, including gauze tamponade associated with a macerated tranexamic acid tablet.

Among the 45 patients medicated with targeted anticoagulants, 1 (2.22%) had a trans-operative complication, which was resolved following the usual protocol, and 1 (2.22%) reported an episode of post-operative bleeding, but did not seek medical assistance. There were no complications, either trans- or post-operative, among the patients using targeted anticoagulants associated with ASA.

Only one report of a previous history of bleeding was identified among the patients analyzed. However, this patient had an INR within therapeutic levels, with values of up to 3.5, and did not show any trans- or post-operative complications in the procedures carried out at HC UFMG during the period evaluated.

DISCUSSION

We analyzed 174 medical records of patients taking oral anticoagulants who had undergone 292 dental procedures with the potential for bleeding. Among these patients, 8 (4.60%) had bleeding complications, 3 (37.50%) in the transoperative period and 5 (62.50%) in the postoperative period.

In this study, all the procedures were carried out without stopping the medication, following the outpatient anticoagulation protocol recommended by the PBH¹⁵ and adopted by SEDTO/HC-UFMG. This protocol states that procedures can only be carried out if the INR is within the therapeutic range, according to tests carried out no more than 24 hours before the procedure. If the INR values are outside the standards, the procedure is postponed until the levels are adjusted. The scientific literature reinforces that, for patients using anti-

coagulants, maintaining the medication during dental procedures is safe as long as the INR remains within therapeutic levels. Studies indicate that suspending anticoagulation can significantly increase the risk of thromboembolic events without a relevant reduction in the risk of hemorrhagic complications^{3, 12}.

The use of local hemostatic agents and minimally invasive surgical techniques has proven effective in preventing excessive bleeding during and after procedures. These findings corroborate the proposal of the protocol adopted by PBH and used in this study, which seeks to ensure patient safety without compromising the effectiveness of anticoagulant therapy.

The dental management of patients on anticoagulant therapy has been widely debated in the literature. The first recommendations for individuals taking vitamin K antagonists (VKAs) included the interruption and/or replacement of anticoagulant therapy before dental surgical procedures¹⁶. However, the results of this study, which indicate less than 5% of trans- or post-operative complications, contradict this practice.

According to current guidelines, it is not necessary to suspend anticoagulants¹⁷ for minor dental procedures with a low risk of bleeding. In addition, studies indicate that adjusting or suspending the dose of anticoagulants before less complex dental procedures can lead to higher thromboembolic risks than hemorrhagic complications¹⁸.

Even so, studies show that the decision to maintain, suspend, delay or change anticoagulant therapy should take into account the individual bleeding risk, the type of procedure and the anticoagulant used¹⁰. This decision should ideally be made jointly by the doctor and the dental surgeon responsible for the patient. This study, like others, found that most dental procedures, including surgical ones, can be carried out safely as long as the INR remains within therapeutic levels⁴.

In general, the therapeutic range of INR should vary between 2.0 and 3.5, al-

though higher values may be considered therapeutic depending on the patient's condition¹⁹. For the control of venous thrombosis, values between 2 and 3 are adequate, while patients with prosthetic heart valves often need an INR of around 3.5²⁰.

The effect of anticoagulants varies between individuals and, in some circumstances, higher INR values are still considered therapeutic²¹. This variation highlights the importance of personalizing management in order to avoid hemorrhagic or thromboembolic complications. Records of complications show that although seven cases were related to alveolar extractions, only one occurred after supragingival scraping. These results reinforce the need to assess the complexity of the procedure, as established by the PBH protocol¹⁵.

Although the incidence of post-operative bleeding in patients treated with anticoagulants is low, studies warn that this risk should not be underestimated and requires close monitoring²². In addition, there is consensus that bleeding complications can be effectively controlled with local hemostatic techniques and agents, such as sutures, gauze pads, gelatin sponges, mouthwashes with tranexamic acid and fibrin sealants²³.

Studies emphasize that the type and dose of anticoagulant can influence the severity of possible bleeding²⁴. However, this study did not identify significant evidence that differentiates the risks of bleeding between AVK anticoagulants and DOACs. These findings, in line with other studies¹², show that following appropriate protocols contributes to the safety of procedures. In addition, they reinforce that excessive post-operative bleeding events are rare, as long as precautions are properly adopted¹⁹.

A complete assessment of the patient, including a detailed anamnesis, is also essential for planning the care protocol¹². Aspects such as the type of dental procedure, medical history and the availability of local or systemic hemostatic measures should be carefully considered¹⁰.

Based on the data presented, it can be seen that the adoption of appropriate tools and protocols in the dental care of anticoagulated patients results in low complication rates. Previous evidence highlights the need for well-prepared professionals, emphasizing that errors in care, often caused by a lack of knowledge, can compromise the quality of care²⁵.

Given these findings, the technical knowledge of the dental surgeon becomes crucial for the safe and effective management of anticoagulated patients undergoing dental procedures with a risk of bleeding. By establishing clear guidelines, the PBH protocol provides fundamental support for carrying out safe procedures, in line with the best available scientific evidence.

CONCLUSION

The study suggests that the protocol for the care of anticoagulated patients, made available by the PBH, is effective and enables dental procedures to be carried out safely on this public. In addition, it is inferred that, in order to carry out dental management of patients who use anticoagulants, it is essential to carry out careful planning, always respecting the individuality and needs of each patient. Complementary tests are also important and should be requested in order to outline the conduct and protocol of care.

Given the scope and limitations of this study, expanding the investigation with more diverse and representative samples, including patients at different levels of anticoagulation and with varying systemic conditions, could strengthen future research. Similarly, comparative studies on the hemorrhagic risks associated with different types of anticoagulants, such as direct oral anticoagulants (DOACs) and vitamin K antagonists (VKAs), could provide valuable insights. Analyzing the effectiveness of specific techniques, such as the use of different hemostatic agents and detailed protocols for more complex procedures, also has great potential to enrich existing guidelines.

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