

# Emergency-room doctors' knowledge about oral anticoagulants and its management

## *Conhecimento sobre anticoagulantes orais e seu manejo por médicos de pronto atendimento*

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### Abstract

**Background:** Since its discovery, oral anticoagulants (OA) have been increasingly studied and used to treat different diseases. However, OA may cause adverse drug interactions that bring risks for patients.

**Objective:** To identify the emergency room doctors' level of knowledge about OA and their drug-related or non-drug-related interactions, and to verify if emergency room doctors are prepared to integrate their theoretical knowledge and the routine of the emergency room.

**Method:** A questionnaire was administered to 100 emergency room doctors working at two public hospitals and three private hospitals in Curitiba, Brazil. The objective of the questionnaire was to find out: if emergency room doctors asked patients about the use of OA, which OA doctors were familiar with, which control exam would be appropriate, what doctors knew about the synergism with OA, how complications were managed, and if doctors were interested in knowing more about OA.

**Results:** Sixty percent of the doctors reported to ask patients about the use of OA, 81% had insufficient knowledge regarding the synergism between some substances and OA, 15% were unaware of which exams are used to follow up anticoagulated patients, 50.7% did not know the commercial names of OA, 4% were unaware of OA antidotes, and 92% revealed interest in improving their knowledge about OA.

**Conclusion:** The number of emergency room doctors who were familiar with OA is low, as well as the number of those who know how to manage anticoagulated patients. The percentage of doctors who did not ask patients about the use of OA and who were unaware of the principles of drug synergism is high, and most of them were interested in improving their knowledge about anticoagulants.

**Keywords:** Anticoagulants, emergency medical services, drug interactions.

### Resumo

**Contexto:** Desde sua descoberta, os anticoagulantes orais (AO) têm sido cada vez mais estudados e aplicados em diferentes doenças. No entanto, eles apresentam reações medicamentosas com fármacos que trazem riscos ao paciente.

**Objetivo:** Identificar o nível de conhecimento dos médicos plantonistas de pronto atendimento sobre os AO e suas interações, medicamentosas ou não, e verificar se o médico frentista está preparado para integrar o conteúdo teórico com a rotina de urgências.

**Método:** Aplicou-se um questionário a 100 médicos atuantes em pronto atendimentos de dois hospitais públicos e três privados em Curitiba. Visou-se saber se o médico frentista questiona ao paciente sobre o uso de AO. Também, avaliou-se o conhecimento do profissional e seu interesse em saber mais sobre: AO (quais deles conhecia); exames para controle; sinergismo com AO; e manejo das complicações.

**Resultados:** Dos 100 entrevistados, 60% declararam perguntar ao paciente sobre o uso de AO, 81% tinham conhecimento insuficiente a respeito do sinergismo de algumas substâncias apresentadas e os AO, 15% desconheciam qual exame é utilizado para acompanhamento dos pacientes anticoagulados, 50,7% não sabiam os nomes comerciais dos AO, 4% desconheciam seu antídoto, e 92% manifestaram interesse em melhorar seus conhecimentos sobre os AO.

**Conclusão:** É baixo o número de médicos que atende em pronto atendimentos que conhece sobre os AO e que sabe manejar pacientes anticoagulados. É alta a porcentagem de médicos que não perguntam aos pacientes sobre o uso de AO e que desconhecem princípios do sinergismo medicamentoso, sendo que a maioria se interessou em melhorar seus conhecimentos sobre os anticoagulantes.

**Palavras-chave:** Anticoagulantes, serviços médicos de emergência, interações medicamentosas.

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## Introduction

Blood coagulation is a part of the hemostatic mechanism, consisting of the formation of a solid mass composed by a fibrin network in which elements present in the blood (red blood cells, white blood cells, platelets) are adhered. When the process occurs inside a vessel, it receives the name of thrombosis.<sup>1</sup>

Therefore, anticoagulants are indicated in diseases like venous thromboembolism, acute arterial occlusion, valvulopathies with valve prosthesis and atrial fibrillation.<sup>1</sup>

Some oral anticoagulants (OA) present drug interactions with several other drugs as non-steroidal anti-inflammatory drugs and oral contraceptives, as well as alcohol and some foods.

Thus, it is important for an emergency-room doctor to have some information on OA and their drug interactions in case an anticoagulated patient presents for an emergency medical treatment and asks questions about these drugs.

Contraindications and drug interactions involving OA should be analyzed whenever the use of these medications is necessary, once complications resulting from the misuse of the drug may occur.<sup>1</sup>

The fear of hemorrhages and other intercurrents result in an underutilization of OA.<sup>2</sup> To this problem is added the emergency room doctors' lack of knowledge about these drugs and their possible interactions with other drugs. This study analyzes the level of knowledge of these doctors.

## Material and methods

A questionnaire with 11 items was administered to 100 emergency room doctors working in two public institutions – Hospital de Clínicas and Hospital do Trabalhador – and two private clinics – Hospital Santa Cruz, Hospital Vita Batel and Hospital Nossa Senhora das Graças – in the city of Curitiba, Brazil.

The study was aimed at general practitioners, orthopedists and residents of Internal Medicine and Orthopedics acting as emergency room doctors. The participants signed an informed consent form; those who refused to sign it were excluded from the study.

Questionnaire administration occurred from June to December 2008, since its approval by the Research Ethics Committee of the Hospital de Clínicas da Universidade Federal do Paraná.

In a total of 100 interviewed doctors, 72% were men. Thirty seven percent of interviewees were clinicians, of

them 11% were orthopedists, and 26% residents of Internal Medicine and Orthopedics, and 29% were surgeons.

The objective of the questionnaire was to find out if the doctor asked the patient about OA use, which OA drugs the doctor knew, what they knew about OA synergism, if they knew the control exam for OA and how complications should be handled. It was also asked if the doctor was interested in knowing more about OA.

A direct question was posed to the emergency room doctor in order to know if they questioned the patient on OA use:

*In a consultation during your work period in the emergency room, do you ask if the patient uses some sort of OA?*

Nine questions were posed to assess the doctors' knowledge about OA. The first question was:

*Which OA drugs do you know?*

Then, the interviewee was asked to point in a table with a list of drugs, which were OA and which were antiplatelet drugs (AD):

*Mark with an A the oral anticoagulants, P the antiplatelet drugs and N the other drugs in the list presented below:*

*Tromexan<sup>®</sup>*

*Celebrex<sup>®</sup>*

*Sintrom<sup>®</sup>*

*Lescol<sup>®</sup>*

*Plavix<sup>®</sup>*

*Marevan<sup>®</sup>*

*Marcoumar<sup>®</sup>*

*Aspirin<sup>®</sup>*

*Dindevan<sup>®</sup>*

*Plaquenil<sup>®</sup>*

*Zocor<sup>®</sup>*

*Ticlid<sup>®</sup>*

*Persantine<sup>®</sup>*

*Coumadin<sup>®</sup>*

Then the interviewee was asked about the existence and the name of a control exam for OA:

*Do you know about any specific exam to evaluate a patient using OA? What exam is this?*

The interviewee was asked about the synergism with a direct question followed by a table related to the question:

*What do you know about drug synergism with OA?*

*Mark with a "+" the drugs that increase OA's action; with a "-" the drugs that decrease OA's action; and with an "N" the drugs that do not interact with OA.*

*Amiodarone*

*Barbiturics*

*Carbamazepine*

*Alcohol drinks*

*Clofibrate*

*Lovastatin*

*Benzodiazepines*

*Oral contraceptives*

*Rifampicin*

*Mineral oils*

*Tricyclic antidepressants*

*Opiates*

*Milk*

*Metronidazol*

*Hypoglycemic agents*

*Paracetamol*

*Anti-histaminic*

*Diuretics*

Three direct questions were posed to assess the handling of OA synergism:

*In case of drug synergism potentializing OA's action, which should be the emergency room doctor's attitude?*

*And in case of an interaction minimizing OA's action?*

*What are the antidotes for OA?*

In the end of the questionnaire it was asked whether the doctor was interested in continuous learning about OA:

*Would you like to know more about OA?*

## Results

When questioned whether they asked the patient during a consultation if he or she used any OA, most doctors (60%) reported that they asked the question directly.

In the question about the interviewee's knowledge on drug synergism, only 19% reported having a sufficient knowledge on the subject. In fulfilling the list of drugs responsible for the interaction, the mean rate of errors was 82.5%. A total of 81% interviewed doctors showed sufficient knowledge about OA.

In relation to the OA they knew, 72% cited Marcoumar<sup>®</sup>, and out of these 50% also cited Marevan<sup>®</sup>. However, of those who cited Marcoumar<sup>®</sup>, 11% also cited AAS<sup>®</sup>, and 3% mentioned heparin as an OA.

In the question where the subjects had to classify as OA, AD or none the drugs presented in a table, mean rate of errors was 53%.

When asked if they knew about some exam to assess OA use, 95% of the doctors answered positively, and 85% out of these named the exam correctly.

In the question about the antidote used in hemorrhage complications in anticoagulated patients, 65% answered it was vitamin K, half of these also answered fresh plasma, and 35% did not know the antidote.

The last question was whether the doctor was interested in learning more about OA drugs. Most of them (92%) answered positively.

## Discussion

The research results revealed that, although doctors ask the patient about OA use, they have no sufficient knowledge about synergism and drug interactions involving OA. Most of the doctors do not know the commercial names of these products, and mistake them for other drugs, especially those of the AD group. This is important in cases in which the doctor asks only which medications the patient is using.

OA drugs have a high drug interaction with other drugs, and the main complication is hemorrhage. Annual average of fatal bleeding in patients using warfarin is 0.6%, of major bleeding is 3% and major or minor bleeding is 9.6%. Comorbidities and age also contribute for the increase in risk of complications.<sup>3</sup> These data show us that doctors need to know what drug should be administered in cases of hemorrhagic complications.

In this study, only 65% of the doctors answered correctly that vitamin K is the substance that reverts anticoagulant action, and half of these interviewees also answered fresh plasma. It was believed, particularly in this point, that the index should be 100%, since the simple administration of vitamin K and plasma may be determining between life and death for the patient.

Several studies indicate OA's drug interactions with non-steroidal anti-inflammatory drugs, oral contraceptives, carbamazepine, phenytoin, phenobarbital, selective serotonin reuptake inhibitors and in hormone replacement treatments which use tibolone.<sup>4</sup> In addition, other studies verify the relation of OA with foods ingested in the diet with drugs derived from plants. However, it is difficult to

foresee which will be these interactions and what will be their severity.<sup>5</sup>

Caprini et al.,<sup>6</sup> in a cohort study involving 38 U.S. hospitals, have evaluated doctors' adherence and the impact of their attitudes related to treatment guidelines for venous thromboembolism, concluding that there is a difference between the treatment as prescribed by the guidelines and the treatment provided in these hospitals. Medical knowledge, as well as doctors' attitudes and beliefs, are involved in these differences and consequently in whether the guidelines are followed or not.

Results also indicated that 95% of doctors know about the existence of an exam to assess the use of anticoagulants, but only 85% knew what was this exam, namely, Prothrombin Time. These data may indicate that, in addition to the doctors' request of a huge variety of exams, these exams are often useless for anticoagulated patients. This results in unnecessary expenses for the healthcare institution and in risks for the patient.

Couris et al.<sup>7</sup> have assessed the healthcare professionals' knowledge about interactions between warfarin, vitamin K, and nutrients. The study concluded that most doctors are proficient in their specialty, but deficient in others. More information and integration of knowledge about warfarin's drug interactions are needed for the doctor to correctly guide the patient.

The result of 92% of interest in knowing more about OA also alerts us that 8% of doctors think they do not need to know more about the subject. The problem is that if a doctor does not act correctly with anticoagulated patients, they will hardly admit their deficiency and try to act correctly.

Due to difficulties of handling current OA, new direct and indirect oral thrombin inhibitors are being researched.

Ximelagatran began to be commercialized, but, due to hepatic complications, it was withdrawn.<sup>8</sup> Rivaroxaban<sup>9</sup> and dabigatran have been released for TEV prophylaxis in knee and hip surgery. The latter is already available in the Brazilian market.<sup>10</sup> In addition to these drugs, apixaban<sup>11</sup> is in phase III of research for TEV treatment.

These new OA aim at aiding the handling of antivitamins K, and expectations for the results of researches on their effects is high, but they still have a long life in Brazil due to their low monthly treatment cost.

## Conclusion

It was concluded that few emergency room doctors know oral anticoagulants and how to handle anticoagulated patients. A high percentage of doctors do not inquire

patients about OA use and are unaware of the principles of drug synergism.

It was also observed that the lack of knowledge on OA interactions exposes anticoagulated patients who seek emergency treatment to serious complications as severe hemorrhages and even death.

Finally, all these facts determine the need to create continuous learning programs on the subject directed to doctors.

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