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EDITORIAL COMMENT

The impact of delays in inter-hospital transfers on ST-elevation myocardial infarction

Impacto dos atrasos nas transferências inter hospitalares no prognóstico dos doentes com Enfarte Agudo do Miocárdio com supradesnivelamento do segmento ST

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The guidelines for ST-elevation myocardial infarction (STEMI) care[1] provide an overview of therapies and strategies that improve prognosis and reduce mortality in patients presenting with STEMI.[2,3] It has been shown that adherence to guidelines is associated with improved outcomes. One of the most important therapeutic strategies is reperfusion therapy, which needs to be initiated as soon as possible. The main goal is to perform primary angioplasty in less than 60 min, or less than 90 min, depending on whether the patient is admitted to a hospital with or without on-site percutaneous coronary intervention (PCI) facilities. The interval between arrival at the first hospital and transfer to a hospital with PCI facilities is called door in-door out (DIDO) time, and the European guidelines recommend that this time should ideally not exceed 30 min.

In real-world situations there is marked asymmetry in time to reperfusion between hospitals with and without on-site PCI capacity, with the latter presenting a longer time until revascularization.[4]

In this issue of the *Journal*, Oliveira et al. present a study aiming to assess the impact of DIDO time in hospitals without on-site PCI on total ischemia time and clinical outcomes in patients with STEMI.[5]

The median DIDO time was 82 min (interquartile range 61–132 min). Only 1.3% of the patients were transferred in $\leq$30 min, while 75.3% were transferred in more than 60 min and 42.1% in more than 90 min. Patients with DIDO times >60 min had significantly longer system delays (207.3 min vs. 112.7 min; p<0.001) and total ischemia time (344.2 min vs. 222 min; p<0.001) compared to those with DIDO time $\leq$60 min. Observed in-hospital mortality was significantly higher among patients with DIDO time >60 min than in those with DIDO times of $\leq$60 min (5.1% vs. 0%; p=0.006). The adjusted odds ratio for in-hospital mortality was 1.27 (95% confidence interval 1.062–1.432). Up to the end of follow-up, patients in the >60 min group had higher mortality (p=0.016), and their survival time was significantly lower (p=0.011).

Regarding medical history, patients with estimated DIDO time $\leq$60 min were more likely to have a history of smoking compared to the >60 min group. By contrast, patients belonging to the >60 min group were more likely to have hypertension. Regarding the other variables – chronic kid-

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ney disease, heart failure, transient ischemic attack/stroke, valvular disease, peripheral arterial disease, coronary heart disease, coronary bypass, previous myocardial infarction, previous PCI, diabetes and hypercholesterolemia – no statistically significant differences were found between the groups.

Prehospital transport has an essential role in the reduction of reperfusion times. When patients call the emergency number and the prehospital emergency medical service (EMS) performs an electrocardiogram leading to a diagnosis of STEMI, they can be transferred immediately to a PCI center. But when patients go to a non-PCI center the problem is one of the hospital's organization and its ability to provide rapid transport to a PCI center.

In Portugal, before 2016 the EMS was responsible for the secondary transport of patients in the coronary fast-track system. From 2016 onwards, hospitals were given the main responsibility for the management of secondary transport and the EMS was only to be used in situations in which hospitals could not carry out this function. As there was a decrease in secondary transport carried out directly by the EMS and hospitals have difficulties in organizing and managing an efficient transport system, the consequence was an increase in delays.[6]

In their study, Oliveira et al. demonstrate that patients belonging to the group with >60 min DIDO time had higher mortality, and their survival time was significantly lower, so the lesson of this paper is that if patients use hospital units without the ability to perform PCI, there should be mechanisms for rapidly addressing and screening patients with chest pain and performing an immediate evacuation protocol when a diagnosis of STEMI is confirmed. It is therefore essential for decision-makers and public health authorities to implement public health policies that will provide rapid inter-hospital transfer systems that will help reduce the mortality of STEMI patients.

Conflicts of interest

The author has no conflicts of interest to declare.

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