Rev Port Cardiol. 2020;**39(3)**:133–135

Revista Portuguesa de
Cardiologia
Portuguese Journal of ***Cardiology***
www.revportcardiol.org

EDITORIAL COMMENT

Delays in the treatment of acute coronary syndrome: Still a contrast between pathophysiology and reality☆

Atraso no tratamento das síndromes coronárias agudas – quando a realidade ainda contrasta com a fisiopatologia

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Available online 12 June 2020

> ''Here's to the crazy ones, the misfits, the rebels, the troublemakers, the round pegs in the square holes, the ones who see things differently . . . they have no respect for the status quo. You can quote them, disagree with them, glorify or vilify them, but the only thing you can't do is ignore them. Because they change things. They push the human race forward. While some may see them as the crazy ones, we see genius. Because the people who are crazy enough to think they can change the world, are the ones who do.''
>
> – Steve Jobs

Acute coronary events remain one of the leading causes of death in developed countries. Rapid identification and treatment of these patients is crucial to their outcomes, and is a challenge not only to the clinical teams responsible for their treatment, but also to the performance and organization of the health care system as a whole.

For ST-elevation myocardial infarction (STEMI), primary angioplasty is unquestionably the best treatment, as it is superior not only in efficacy but also in safety to the alternative of fibrinolysis, which nowadays is considered a second-line treatment, to be used only when percutaneous coronary intervention (PCI) cannot be offered in a timely manner.[1] Consequently, many hospitals have been provided with catheterization laboratories on call 24/7 to treat myocardial infarction (MI) patients, and referral networks have been established in order to balance geographic coverage with the centers' volume and experience. To take the extreme case, even if it were economically feasible to provide every hospital in the country with a catheterization laboratory, this would not be the best solution, since hospitals with a smaller turnover would be unable to maintain teams with the level of experience required to treat their patients safely and effectively. In recognition of this, the international guidelines recommend minimum levels of experience for both operators and centers involved in primary angioplasty programs.[2]

This balance between geographic coverage and volume of procedures means that patients frequently need to be transferred between hospitals. As has recently been reported,[3,4] this leads to significant delays in treatment. However, educating the population about the symptoms of MI and how it is treated, as well as how patients and their families should act when symptoms occur, can help reduce these delays, not

☆ Please cite this article as: de Araújo Gonçalves P. Atraso no tratamento das síndromes coronárias agudas – quando a realidade ainda contrasta com a fisiopatologia. Rev Port Cardiol. 2020;39:132–134.

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only by ensuring that the situation is rapidly recognized and acted upon, but also by educating people to activate the coronary fast-track system so that the patient can immediately be set on their way to a PCI-capable center. The European initiatives Stent for Life and Stent – Save a Life, designed to address these issues, have been implemented in Portugal since 2011 and are a veritable case study in success.[5,6]

It is against this background that the study by Viana et al. assessing treatment delays in patients with acute coronary syndrome (ACS) is published in the issue of the *Journal*.[7] One of the interesting aspects of their study, which analyzed a cohort of 949 patients admitted to hospitals in two different geographic areas, is that it assessed not only system delays, particularly between first medical contact and angioplasty, but also patient delays, mainly from symptom onset to first medical contact. In around half of the study population (43% of those with STEMI and 52–58% of those with non-ST-elevation ACS), the maximum delay of 120 min between symptom onset and first medical contact recommended in the guidelines was exceeded. The authors identified two major reasons for patient delays: use of patients' own transportation to the hospital rather than the coronary fast-track system, and failure to correctly interpret symptoms as cardiac in origin. The fact that these problems were still commonplace in patients treated as recently as 2013-2014 reflects the current situation in Portugal and highlights the need to continue campaigns to increase awareness in the population, such as the Stent for Life initiative and its continuation, Stent – Save a Life, developed by the European Association of Percutaneous Cardiovascular Interventions and implemented in Portugal by the Portuguese Association of Cardiovascular Intervention (APIC) (https://www.apic.pt; https://www.cadasegundoconta.pt). The success of this initiative has led to it being adopted by most European countries and it now has a global dimension, having been implemented by 27 medical societies worldwide (https://www.stentsavealife.com).

In the study by Viana et al.,[8] system delays were beyond the recommended times in 78% of STEMI patients. One of the factors related to this figure was initial admission to a non-PCI-capable center, which again highlights the need to increase awareness of this problem both in the general population and in health professionals. Only 53% of STEMI patients were admitted directly to a PCI-capable center; in multivariate analysis admission to a non-PCI-capable hospital was the strongest predictor (odds ratio 5.8) of a delay of >90 min between first medical contact and PCI. This emphasizes once again the need to focus on patient education and on secondary transport.[4]

In the recent FITT-STEMI trial,[9] which included over 12 500 patients with STEMI treated by primary PCI, a nearly linear relationship was found between first medical contact to treatment time and mortality, although this was much clearer in patients in cardiogenic shock, in whom every 10 min of delay led to a mean increase of 3.3 additional deaths per 100 PCI-treated patients. One of the most important findings from this large registry was the authors' estimation of the potential time savings that would result from three simple measures: a mean of 5.4 min for a pre-hospital electrocardiogram, 17.5 min for pre-announcement of the patient's transport by telephone, and an impressive 33.2 min for bypassing the emergency department and direct transport to the catheterization laboratory.

Publication of data on treatment delays in Portugal[9] has also improved our knowledge of the situation in this country and helped to identify opportunities for improvement. Although the results are still far from ideal, and there have been no significant improvements in either patient delay or system delay in recent years, other indicators give a better picture of the successes of the national primary angioplasty program. These include the number of patients treated by primary PCI, which more than doubled in 10 years (from 106 per million population in 2002 to 308 per million population in 2013), and the percentage of patients using the national emergency medical response system, which almost trebled between 2011 (13%) and 2016 (31%).[4]

As physicians we were trained to provide the best possible health care to our patients, but we may spend too much time on decisions – ticagrelor or clopidogrel, Onyx or Orsiro stents – that have a much smaller impact on the patient's health, often with only marginal absolute differences in risk between the alternatives, when greater health benefits will accrue from improvements in education, organization of health systems, and access to treatments. These improvements are also our responsibility: ''Because the people who are crazy enough to think they can change the world, are the ones who do.''

Conflicts of interest

The author has no conflicts of interest to declare.

References

1. Ibanez B, James S, Agewall S, et al. ESC Scientific Document Group. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation: The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC). Eur Heart J. 2018;39(2):119–77.
2. Neumann FJ, Sousa-Uva M, Ahlsson A, et al. 2018 ESC/EACTS Guidelines on myocardial revascularization. Eur Heart J. 2019, http://dx.doi.org/10.1093/eurheartj/ehy394.
3. Ferreira AS, Costa J, Braga CG, Marques J. Impacto na mortalidade da admissão direta versus transferência inter-hospitalar nos doentes com enfarte agudo do miocárdio com elevação do segmento ST submetidos a intervenção coronária percutânea primária. Rev Port Cardiol. 2019, http://dx.doi.org/10.1016/j.repc.2019.02.005.
4. Pereira H. Transporte secundário: ainda um importante entrave ao desempenho das Vias Verdes em Portugal? Rev Port Cardiol. 2019, http://dx.doi.org/10.1016/j.repc.2019.11.001.
5. Pereira H. Primary angioplasty in Portugal: Door-to-balloon time is not a good performance index. EuroIntervention. 2012, http://dx.doi.org/10.4244/EIJV8SPA21.
6. Pereira H, Pinto FJ, Calé R, et al. The Stent for Life initiative: Factors predicting system delay in patients with ST-segment elevation myocardial infarction. Rev Port Cardiol. 2018, http://dx.doi.org/10.1016/j.repc.2018.01.011.
7. Viana M, Laszczyńska O, Araújo C, et al. Patient and system delays in the treatment of acute coronary syndrome. Rev Port Cardiol. 2020, http://dx.doi.org/10.1016/j.repc.2019.07.007.

8. Scholz KH, Maier SKG, Maier LS, et al. Impact of treatment delay on mortality in ST-segment elevation myocardial infarction (STEMI) patients presenting with and without haemodynamic instability: Results from the German prospective, multicentre FITT-STEMI trial. Eur Heart J. 2018, http://dx.doi.org/10.1093/eurheartj/ehy004.

9. Pereira H, Calé R, Pinto FJ, et al. Factors influencing patient delay before primary percutaneous coronary intervention in ST-segment elevation myocardial infarction: The Stent for life initiative in Portugal. Rev Port Cardiol. 2018, http://dx.doi.org/10.1016/j.repc.2017.07.014.