

## Role of medical emergency systems in sudden death

### *Papel de los sistemas de emergencia médica en la muerte súbita*

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#### ARTICLE INFORMATION

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The emergency medical care services have developed an extraordinary efficiency in the treatment of conditions that require an immediate medical solution, but this efficiency is strongly subjected to the time of arrival and action of the emergency services since the beginning of the cardiac arrest. As an example, the effect on out-of-hospital sudden deaths in untreated cardiac arrests is highlighted when the time of attendance of the ambulance to the site of the arrest is reduced (usually less than 15 minutes)<sup>1</sup>.

Out of 13820 registered arrests, complete data were obtained in 10554 (76%). A total of 663 patients survived to hospital discharge (6%). When adjusting the significant covariates, it was found that reducing the time of arrival of the Medical Emergency Systems (MES) was associated with a greater chance of defibrillation and improved survival figures of those who could be defibrillated. Reducing the time of arrival from 90 to 8 minutes increased the survival to 8%, and reducing it to 5 minutes, increased it to

10.13%, almost twice the initial value<sup>1,2</sup>.

The need for automated external defibrillators (AED) for the immediate street rescue has shown superior results to those obtained with defibrillation by the MES, given their greater time of arrival to the place for the event<sup>3</sup>. Similar conclusions were reached by the authors of the publication "Strategies to Improve Cardiac Arrest Survival" of the Institute of Medicine of the National Academy<sup>4</sup>.

Important to consider are the variables involved in the characteristics of the cardiac arrest: such as the place where it occurs: residence (location of maximum occurrence), geriatric institution, street or road, health rooms, places of recreation, industrial establishments, public transport or others<sup>5</sup>. The type of cardiac arrest is a remarkable indicator, therefore it is much more ominous the one that is produced by asystole or electrical activity without pulse, than the one caused by ventricular fibrillation or ventricular tachycardia without pulse, as shown by Martínez Losas (Congress of the Spanish Society of Cardiology, 2016), where the initial drop in survival of the first weeks after the episode and rescue is significantly higher in patients with rhythms that were not defibrillatable, a difference that remains and even grows in the next 60 months.

The speed with which the defibrillation is performed also plays an undoubtedly function, as it is

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clear from the presentation of Rafecas Ventosa *et al.*<sup>6</sup> in the same congress, where better neurological results are shown in those treated with AED (paradigm of earlier access) than by SEM, and it is not that the SEM does not have the necessary means to face this clinical emergency.

The city of Buenos Aires has several SEMs, one of which is state and public, and of high efficiency, the *Sistema de Atención Médica de Emergencia (SAME)*, which has highly trained medical and paramedical staff, and the necessary technical elements for that task. More than 200 thousand interventions of all types per year are the evidence. The other private emergency services add almost as much activity as the SAME, with similar competence and efficiency, but they have not been able to improve the survival of cardiac arrest because it is firmly linked to the time of onset of resuscitation, and this, in turn, it is tied to the ease with which emergency teams arrive to the place of occurrence.

The possibility of AED in different places can reduce the out-of-hospital sudden death. Some approaches for a quick disposition of the AED, such as their drone transport, seem to open some hope; but cities are not friendly places for drones, which must fight across the street tangle of cables, making their descent difficult and therefore the one of the AED.

#### CONFLICT OF INTERESTS

None

#### REFERENCES

1. Gurger M, Turkoglu A, Atescelik M, Bork T, Tokdemir M, Alatas OD, *et al.* Sudden suspected death in emergency department: Autopsy results. *Turk J Emerg Med.* 2016;14(3):115-20.
2. Ewy GA, Ornato JP. 31st Bethesda Conference. Emergency Cardiac Care. Task force 1: Cardiac arrest. *J Am Coll Cardiol.* 2000;35(4):832-46.
3. Pell JP, Sirel JM, Marsden AK, Ford I, Cobbe SM. Effect of reducing ambulance response times on deaths from out of hospital cardiac arrest: cohort study. *BMJ.* 2001;322(7299):1385-8.
4. Committee on the Treatment of Cardiac Arrest: Current Status and Future Directions; Board on Health Sciences Policy; Institute of Medicine; Graham R, McCoy MA, Schultz AM, editors. *Strategies to improve cardiac arrest survival: A time to act.* Washington (DC): National Academies Press (US); 2015.
5. Girotra S, van Diepen S, Nallamothu BK, Carrel M, Vellano K, Anderson ML, *et al.* Regional variation in out-of-hospital cardiac arrest survival in the United States. *Circulation.* 2016;133(22):2159-68.
6. Rafecas Ventosa A, Bañeras J, Milà L, Buera I, Rueda F, Barrabés JA, *et al.* ¿Tienen los supervivientes de un paro cardiaco extrahospitalario mejor pronóstico si han sido tratados con un desfibrilador externo automático de uso público? *Rev Esp Cardiol.* 2016;69(Supl. 1):508 [Resumen].