

compartments of medical specialties, in a change of culture affecting the specialties involved in attending these patients and putting professional exclusiveness and territorial concerns aside.

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## On the Characteristics of Out-of-hospital Sudden Cardiac Death Survivors. Response



### *Sobre las características de los supervivientes de muerte súbita cardiaca extrahospitalaria. Respuesta*

#### To the Editor,

We appreciate the interest aroused by our article. Having carefully read your letter, we would like to make the following comments.

We consider that the nature of the report in itself, a registry of patients with sudden cardiac death who arrived alive at cardiac intensive care units, explains the predominantly cardiac etiology, as well as the frequent finding of a first shockable rhythm or a lower incidence of sudden cardiac death occurring in the home than in other series. We agree that any other approach to the problem, such as the inclusion of patients who die prior to hospital admission and of those with noncardiac etiology, or study of the length of time that patients received prehospital care in an emergency medical service, constitutes another highly interesting view of the same problem.

Despite the lack of a common protocol, as we mentioned in the section on limitations, a consensus document on postresuscitation care was available at all the centers.<sup>1</sup> This document includes not only therapeutic hypothermia (the criteria for the application of which are explained in detail in the methods section), but also a systematized approach, agreed by consensus, to the comprehensive management of these patients. We consider that, as indicated on other occasions,<sup>2</sup> this is one of the aspects that may have contributed to our promising results, despite the seriousness of the patients' condition at the time of admission.

We take note of the interesting comment on the performance of catheterizations in patients without ST-elevation myocardial infarction: in addition to its use in acute reperfusion therapy, coronary angiography is a tool of unquestionable utility in the study of the etiology in many other patients. We also agree that we

should have referred specifically to the Utstein style,<sup>3</sup> since our variables adapt to its recommendations, as is the case of the use of the Cerebral Performance Category score, which we do mention in the methods section.

In our series, half of the patients included had a good vital and functional prognosis at discharge and 6 months later. As is well known, the first links in the chain of survival are those that have the greatest impact on prognosis, whereas the importance of the steps taken for management following resuscitation is relative.<sup>4</sup> Given that, in our registry, 92% of the cases of sudden cardiac death occurred in the presence of bystanders and only 29% were attended to by these witnesses, we feel that it would be interesting to support health education programs that encourage the general population to receive training in basic cardiopulmonary resuscitation maneuvers.

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## Left Stellate Ganglion Block in Treating Electrical Storm. Importance of Ultrasonography



### *Bloqueo del ganglio estrellado izquierdo como parte del tratamiento de la tormenta arritmica. Importancia de la ecografía*

#### To the Editor,

We read the article “Electrical Storm Secondary to Acute Myocardial Infarction and Heart Failure Treated With Left Stellate Ganglion Block” with great interest.<sup>1</sup> Electrical storm is defined as more than 3 episodes of ventricular tachycardia or ventricular fibrillation within 24 h and requires aggressive medical or invasive treatment in refractory cases. Cardiac sympathetic blockade is considered fundamental to reducing adverse ventricular arrhythmic events associated with coronary ischemia.<sup>2,3</sup> This can be accomplished by the administration of drugs or blockade of the left stellate ganglion (sympathetic trunk [chain] ganglia) in association with antiarrhythmic treatment.<sup>1</sup>

According to our clinical experience, which is similar to that of the authors, we would like to highlight the relevance of ultrasonography when performing stellate ganglion block.

The stellate ganglion—also known as the cervicothoracic ganglion—is between 1 cm and 2.5 cm long, 1 cm wide, and 0.5 cm thick, and is formed by the fusion of the inferior cervical ganglion and the first thoracic ganglion in 80% of the population.<sup>4,5</sup> It lies medial to the scalene muscles and brachial plexus, lateral to the longus coli muscle, trachea, esophagus, thyroid gland, and the recurrent laryngeal nerve, anterior to the transverse processes and prevertebral fascia at C7, superior to the subclavian artery and pleura, inferomedial to the internal carotid artery and internal jugular vein, and posterior to the vertebral vessels.<sup>6</sup> The anatomical arrangement of the stellate ganglion in the vicinity of critical structures can result in severe life-threatening complications. This has led to the abandonment of the “blind” approach and the adoption of imaging techniques such as fluoroscopy or computed tomography. However, these techniques are impractical because they cannot be performed at the patient’s bedside and clinically unstable patients must be moved to areas remote from the critical care unit. There is also the risk of radiation exposure, both for the medical staff and the patient. Although fluoroscopy is less expensive than computed tomography scans and can be used to identify bony structures, it cannot identify other anatomical structures adjacent to the ganglion.

Within the field of imaging techniques, ultrasonography has undergone significant developments regarding its use during procedures in critical care units. It can be used to identify soft tissue, vessels, and nerves<sup>6</sup> (a fundamental aspect in left stellate ganglion block to reduce complications) without exposing the patient and staff to radiation, unlike techniques such as fluoroscopy or computed tomography. Furthermore, the availability of this technique has increased due to the development of small

portable devices, which are well suited for use in these units since they bypass the technical issues typical of other procedures that must be performed in a specific facility. In general, and depending on the equipment used, ultrasound is an inexpensive technique. In our experience, there are other benefits associated with the use of ultrasound during stellate ganglion block procedures: direct realtime visualization of the anatomic location of the ganglion (particularly important in patients with ambiguous external anatomical landmarks or “individual” variations compared to the “norm”); direct realtime visualization of adjacent structures that facilitate its location; direct or indirect realtime visualization of the needle, allowing the route to be adjusted to avoid injury to adjacent structures; and direct or indirect realtime visualization of drug diffusion during injection, with the possibility of relocating the needle in case of malpositioning. Indirectly, this leads to reduced drug doses and, a priori, an increased probability of achieving an optimal procedural result without resorting to physiological changes (the impossibility of assessing miosis and palpebral ptosis in sedated patients).

We have identified further benefits in our clinical practice: improvement in the quality perceived by the patient when conscious; a decreased number of punctures and thus a reduced potential for lesional complications (important in these patients, many of whom are receiving antiplatelet/anticoagulation agents); visualization of the correct position of the catheter in case of continuous blockade; differentiation between intravascular and extravascular injection; and the possibility of teaching the technique to specialists in training (the technique involves a learning curve and training practice).

The abovementioned reasons make ultrasound the imaging technique of choice for stellate ganglion block procedures in critical care units.

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