Scientific letters

Postcardiotomy cardiogenic shock: current status in Spain

Shock *cardiogénico tras cardiotomía: situación actual en España*

To the Editor,

Postcardiotomy cardiogenic shock (PCS) has an incidence between 0.5% and 1.5%, depending on the series, and a mortality over 60%.[1,2] Treatment is based on the use of first-line inotropic drugs and vasoconstrictors, followed by short-term mechanical circulatory support devices in refractory cases. In these cases, venoarterial extracorporeal membrane oxygenation (VA-ECMO) is the type of mechanical circulatory support most commonly used.[1–3] VA-ECMO provides temporary hemodynamic support, thus promoting myocardial recovery and treatment of the underlying heart disease.[2] However, numerous aspects and strategies for the treatment of PCS are still under debate. Most current recommendations are based on expert opinions, given the lack of solid scientific evidence.[4] One of the most controversial topics is the cannulation access site.[1–5] The most common approaches used for central VA-ECMO are cannulation of the right atrium and ascending aorta, whereas peripheral access generally uses the femoral vein and artery.[2,3] There is less experience with several other modalities, for instance, the use of the axillary, subclavian, or innominate artery, as well as cannulation with Dacron grafts.[3]

Other aspects influencing the clinical progress of these patients are the best settings and optimal time to start mechanical circulatory support, the need for left ventricle (LV) unloading, the measures taken to prevent bleeding and thrombosis, and the weaning strategies. The lack of randomized clinical trials on these and other approaches makes it hard to conclude which measures offer the greatest benefit for these patients.[1–6] In addition, the lack of evidence on PCS management results in considerable variability between hospitals, which means that patient treatment is heterogeneous.

In view of the above, the aim of this study was to analyze the current status of PCS management in Spanish hospitals with cardiac surgery departments. For this purpose, an online survey was designed and sent to all of these departments through the Spanish Society of Cardiovascular and Endovascular Surgery.

Among the 50 hospitals with a cardiac surgery unit in Spain, 42 (84%) answered the survey (table 1), 37 (88%) of which are part of the public network. More than 90% of these hospitals have more than 500 hospital beds. Only 2 (5%) hospitals perform $>$ 700 cardiac surgeries with extracorporeal circulation, 14 (33%) perform between 501 and 700, 19 (45%) perform between 300 and 500, and 7 (17%) perform $<$ 300 surgeries. All hospitals have a primary angioplasty program. Approximately 2 out of 3 (62%) implant long-term ventricular assist devices, and 1 out of 3 (38%) also has a heart transplant program. A total of 33 (79%) of these 42 hospitals have a multidisciplinary unit that care for patients in cardiogenic shock and provide cardiac surgery, advanced heart failure management, interventional cardiology, and critical care. Nevertheless, only 26 (62%) of the hospitals have a protocol for the management of PCS.

Almost all hospitals (41/42) provide intra-aortic balloon pump contrapulsation (IABPC) and VA-ECMO, 36 (86%) have Levitronix CentriMag temporary ventricular assist devices (Levitronix LLC, United States), and 31 (74%) have Impella transvalvular pumps (Abiomed Inc, United States). The device of choice for the management of PCS is VA-ECMO in 55% of hospitals versus IABPC in 43%. In 3 out of 4 hospitals, peripheral cannulation for VA-ECMO is preferred over central (74% vs 26%) (figure 1). In peripheral accesses, 30 (71%) are performed using an open approach and 12 (29%) percutaneously.

Only 2 hospitals routinely use LV unloading, whereas 39 (93%) use this strategy according to patient progress (1 hospital reported it does not perform LV unloading). Most often, this technique is performed with IABPC (72%). In addition, 33% also use aspiration cannulas for left chamber unloading as an alternative, 26% use Impella, and 1 hospital uses interatrial septostomy.

Table 1
Hospitals with cardiac surgery departments participating in the survey, according to autonomous community

Andalusia	Hospital Universitario Virgen de la Victoria Hospital Regional Universitario de Málaga Hospital Universitario Virgen del Rocío Hospital Universitario Virgen Macarena Hospital Universitario Virgen de las Nieves Hospital Universitario Reina Sofía Hospital Universitario Puerta del Mar
Aragon	Hospital Universitario Miguel Servet
Canary Islands	Hospital Universitario de Gran Canaria Doctor Negrín Hospital Universitario de Canarias Hospital Universitario Hospiten Rambla
Cantabria	Hospital Universitario Marqués de Valdecilla
Castilla-La Mancha	Hospital General Universitario de Toledo
Castilla y León	Hospital Universitario de León Hospital Clínico Universitario de Valladolid
Catalonia	Hospital Universitario Valle de Hebrón Hospital Clínico de Barcelona Hospital Universitario Germans Trias i Pujol Hospital de la Santa Creu i Sant Pau Hospital Universitario de Bellvitge
Community of Madrid	Hospital Universitario Puerta de Hierro Majadahonda Hospital Universitario Fundación Jiménez Díaz Hospital Universitario 12 de Octubre Hospital Clínico San Carlos Hospital Universitario de La Princesa Hospital Universitario Ramón y Cajal
Chartered Community of Navarre	Hospital Universitario de Navarra Clínica Universidad de Navarra
Valencian Community	Hospital Universitario y Politécnico La Fe Hospital Clínico Universitario de Valencia Hospital General Universitario de Valencia Hospital Universitario del Vinalopó Hospital General Universitario Dr. Balmis
Extremadura	Hospital Universitario de Badajoz
Galicia	Hospital Universitario de A Coruña Hospital Álvaro Cunqueiro
Balearic Islands	Hospital Universitario Son Espases
Basque Country	Hospital Universitario de Cruces Hospital Universitario Basurto
Principality of Asturias	Hospital Universitario Central de Asturias
Region of Murcia	Hospital Clínico Universitario Virgen de la Arrixaca

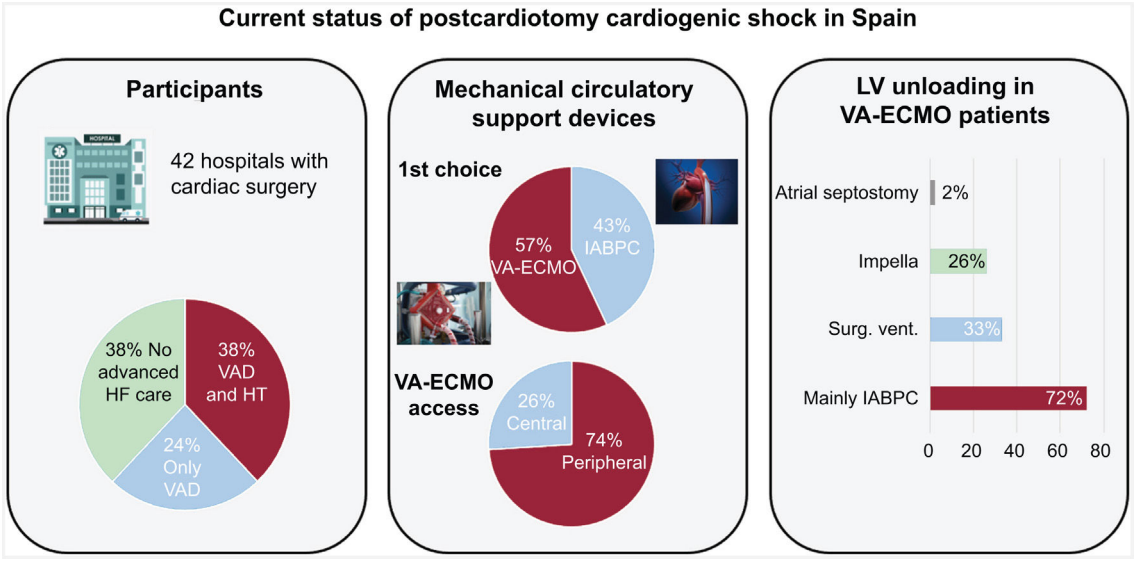

Figure 1. Relevant findings from the survey on postcardiotomy cardiogenic shock management in Spain. HF, heart failure; HT, heart transplant; IABPC counterpulsation, intra-aortic balloon pump counterpulsation; LV, left ventricle; Surg., surgical; VA-ECMO, venoarterial extracorporeal membrane oxygenation; VAD, long-term ventricular assist device; Vent., ventilation.

These survey results report on the current status of PCS management in Spain (figure 1). Most notably, hospital participation in the survey was very high, indicating the level of interest and concern in the topic. As hypothesized, there is considerable heterogeneity in the approach used with these patients due to the lack of solid evidence to support any particular strategy. Around 1 of every 5 hospitals have no multidisciplinary team to care for these patients, and more than a third have no management protocols. Technical aspects, such as the device of choice, the preferential site for cannulation, the approach of peripheral cannulation or LV unloading, reveal the differences between hospitals. Because this is an extremely urgent condition with a small patient population and high mortality, we believe that randomized multicenter studies should be designed to answer these and other questions. In this regard, Spain has a large and well-formed network of hospitals performing cardiac surgery that could spearhead the resolution of some of these questions through teamwork and collaboration in multicenter studies. The limitations of this study are those related to the survey format. Additionally, 8 (16%) of hospitals with cardiac surgery in Spain chose not to answer the voluntary survey.

FUNDING

None.

ETHICAL CONSIDERATIONS

This project did not require approval from the Ethics Committee because it was an anonymous survey of Spanish hospitals with cardiac surgery departments. All patients who underwent procedures signed the respective informed consent forms. Possible sex and gender biases have been taken into account in the preparation of this article.

STATEMENT ON THE USE OF ARTIFICIAL INTELLIGENCE

No artificial intelligence tool was used.

AUTHOR'S CONTRIBUTIONS

J.E. de Villarreal-Soto wrote the manuscript, prepared the survey, and was responsible for image processing and editing. F.J. Hernández Pérez helped to write and evaluate the survey and reviewed the manuscript. J. García Suárez, J. Rodríguez-Roda Stuart, and S.J. Cánovas López reviewed the manuscript. A. Forteza Gil evaluated the survey and reviewed the manuscript.

CONFLICTS OF INTEREST

None.

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Impact of an integrated cardiology-intensive care medicine model on mortality in STEMI

Impacto de un modelo integrado cardiología-medicina intensiva en la mortalidad del IAMCEST

To the Editor,

The organization of care for critically ill cardiac patients has improved significantly in recent years, with the growing involvement of cardiologists.[1] Traditioinally, care has largely been provided by general intensive care units (ICUs).[1] Care models differ substantially both within Spain and Europe, and these differences affect health outcomes. Observations of lower mortality rates in acute and critical care units managed directly by cardiologists have led some scientific societies to suggest that cardiology departments should be responsible for the care of seriously ill cardiac patients.[2,3] Another option is an integrated care model led by cardiologists and intensivists with shared care responsibilities. The effectiveness of such a model compared with one managed exclusively by cardiologists, however, has yet to be determined.

Up to 2020, patients requiring level 2 or 3 intensive cardiac care at *Hospital Universitario Nuestra Señora de Candelaria* in Santa Cruz de Tenerife, Spain, were initially cared for in a traditional intensive care setting providing around-the-clock care. In 2021, however, the hospital introduced an integrated intensive cardiac care model. In this new system, a team of cardiologists and intensivists take joint responsibility for patient care during standard working hours. Outside these hours, patients requiring level 2 care are managed by cardiologists, while those requiring level 3 care are managed by intensivists. Although each team of specialists is responsible for a different group of patients while on call, they continue to collaborate closely. In both the traditional and integrated models, patients discharged from the ICU are managed by the cardiology department until they are discharged from hospital (figure 1).

We conducted an observational study to compare mortality and mean hospital stay between patients with ST-segment elevation myocardial infarction (STEMI) treated with primary or rescue angioplasty under the new integrated model (2022 cohort) versus the traditional model (2019 cohort). All the patients required at least level 2 care. The study was approved by the ethics committee at *Hospital Universitario Nuestra Señora de Candelaria*.

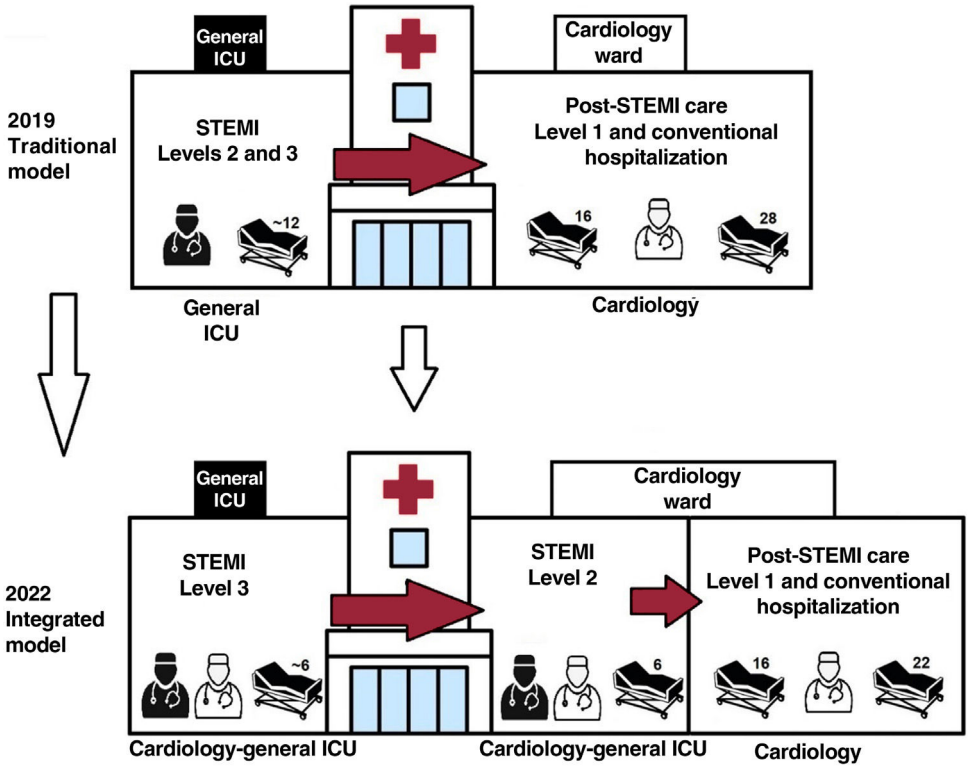

Figure 1. Care process according to organizational model. ICU, intensive care unit; STEMI, ST-segment elevation myocardial infarction.