Authors' reply

Respuesta de los autores

To the Editor,

We thank the authors for their valuable comments on the article "Characteristics, management, and prognosis of out-of-hospital cardiac arrest of cardiac cause according to the treating center."[1] We acknowledge the limitations raised and would like to place our findings in context.

First, we are aware that the Minimum Basic Data Set (MBDS) has limitations inherent to administrative databases. International Classification of Diseases, 10th Revision (ICD-10) codes have a sensitivity of 67% for identifying OHCA among patients who survive to hospital admission and underestimate the true incidence.[2] However, evidence indicates that risk-standardization models based on administrative data perform comparably to standardization using registry data.[3] In Europe, data from the EuReCa-THREE study show a return of spontaneous circulation (ROSC) rate of 31.2% and considerable variability in outcomes across countries, attributable to differences in response systems, treatment times, and hospital structure. This reflects differences in systems of care that our study also identifies in Spain.[4] Although the absence of variables such as initial rhythm, witnesses, and bystander CPR is an acknowledged limitation, it does not invalidate the main finding: there is significant variability in management and prognosis according to the treating center, supporting the need to optimize health care organization. The 2025 European Resuscitation Council (ERC) clinical practice guidelines emphasize that registries are fundamental for identifying opportunities to improve quality of care.[5]

The potential selection bias raised was also acknowledged in the original article. The British randomized ARREST trial showed that, in patients without ST-segment elevation

on the ECG, transfer to specialized centers was not associated with differences in 30-day mortality (31% vs 32%; $P = .86$).[6] However, the 2024 International Liaison Committee on Resuscitation (ILCOR) systematic review, which included 16 European studies and more than 145,000 patients, concluded that cardiac arrest centers are associated with improved neurologically favorable survival in observational studies.[7] Our findings, although observational, are consistent with this European evidence and underscore the need to identify which patients truly benefit.

Finally, the 3.2% transfer rate is indeed low compared with Asian systems but is similar to that of other European systems. Regarding comparison with South Korea, that country has a hospital infrastructure with approximately 4 times as many hospitals as Spain for a population of around 51 million inhabitants, whereas Spain has 840 hospitals serving an older population. Most hospitals in South Korea are privately owned, whereas our study focuses on hospitals within the Spanish National Health System. Lastly, our study does not analyze transfers from the emergency department, but rather patients who were admitted to hospital and subsequently transferred, or not, to another higher-complexity center.

In conclusion, we fully agree that prospective registries integrating prehospital data with detailed clinical variables are required. Despite its limitations, our study provides valuable information on current clinical practice in Spain, is consistent with recent European evidence, and underscores the need to optimize the organization of OHCA care in Spain through integrated systems capable of identifying which patients benefit from treatment at higher-complexity centers.

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