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LETTER TO THE EDITOR

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EXPLORING THE POWER OF PREHOSPITAL DUAL SEQUENTIAL DEFIBRILLATION IN OVERCOMING REFRACTORY CARDIAC ARREST

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To the Editor,

a significant death rate and poor neurological outcomes are linked with refractory ventricular fibrillation (VF). Because the left ventricle is a posterior structure and is located in the part of the heart farthest from the straight line between the conventional anterior-lateral electrode pads, there is a danger that it may not be properly defibrillated. This danger can be reduced by placing an electrode pad closer to the direct line between the anterior and lateral pads. Double sequential external defibrillation (DSED) may result in a higher voltage gradient and more energy provided by the second defibrillator shock across the posterior area of the left ventricle as compared to the conventional anterior-lateral pad design. This enhances the likelihood that the defibrillation will completely terminate the arrhythmia [1]. The practice of DSED has recently garnered a lot of interest as researchers continue their search for novel approaches to the management of refractory VF. The aim of our work was to determine the effectiveness of DSED in relation to the studies conducted so far. The detailed methodology of the survey can be found in the supplementary digital file. Six studies involving a total of 1,360 patients were included in the meta-analysis (Supplementary Tab. 1) [1–6]. Considering all the research ROSC at any time among DSED and standard defibrillation was 37.0% vs. 38.0% (OR = 0.91; 95% CI: 0.46 to 1.77; p = 0.77; Supplementary Tab. 2). There were also no statistically significant differences between DSED and standard defibrillation in terms of other parameters analyzed: survival to hospital admission (35.7% vs 36.1%; OR = 1.24; 95% CI: 0.53 to 2.87; p = 0.62), survival to hospital discharge (19.9% vs 15.0%; OR = 1.12; 95% CI: 0.45 to 2.78; p = 0.80). When we restrict our analysis to include

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the findings of the most current study, which also occurs to be the only randomized trial — DOSE-VF, we find that the DSED had a greater survival to hospital discharge (30.4%; relative risk [RR], 2.21; 95% CI 1.33–3.67) than conventional defibrillation (13.3%). Notably, as compared to normal defibrillation, DSED (RR 2.21; 95% CI 1.26–3.88) was linked with a larger proportion of patients attaining good neurological outcomes (RR 1.48; 95% CI 0.81–2.71). Moreover, as indicated by Kim et al. [5] the use of DSED compared to standard defibrillation was associated with better neurological outcomes (CPC 1 or 2) at 12 months (29.4% vs 9.5%, respectively; OR = 3.96; 95% CI: 0.66 to 23.76; p = 0.13) [2]. A detailed list of the publications included in the above-pooled analyses have been presented in the Supplementary File. Taking into account all the research results so far, we should be skeptical about this topic, however, the limitations in the form of a small number of studies and patients convince us to approach the subject optimistically and continue the research due to the very good results of the DOSE-VF randomized study. DSED may prove to be the future for patients with VF and significantly improve the prognosis of this condition. Both the 2020 American Heart Association Guidelines and the International Liaison Committee on Resuscitation Consensus on Science do not currently support the use of DSED, DOSE-VF could change this approach dramatically and we believe that it should be incorporated in clinician guidelines.

Article information and declarations

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Supplementary material
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