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## Letter to the Editor

# Cardiac REhabilitation and BAsic life Support, the CAREBAS project. Training cardiac patients to save lives: A six-month follow up study



Sir,

Taking advantage of the educational vocation of cardiac rehabilitation (CRH) programs, the CArdiac REhabilitation and BAsic life Support (CAREBAS) project was launched to expand basic life support (BLS) training to high-risk populations: patients suffering acute coronary syndrome (ACS) or revascularization. The aim of this study was to assess these patients' BLS skills retention at 6 months after two different BLS training strategies applied within a CRH program.

One hundred and fourteen patients with coronary artery disease (experimental-group: G-CPR; control-group: G-Stan), enrolled in the 8-week exercise-based CRH program were invited to participate and recruited into two groups. The detailed study protocol has previously been reported.<sup>1,2</sup> Baseline BLS skills (BLS sequence, CPR quality and AED use) were evaluated on a simulated dispatcher-assisted scenario of OHCA (T0) and after a 20-min BLS instruction (T1). At this point, patients attended the same 8-week model of CRH program, which only differed in the exercise-training plan. G-Stan attended a conventional program and G-CPR also received compression-only CPR rolling refreshers on a MinniAnne<sup>®</sup> manikin to substitute some of the upper-body strength exercises. After completing the CRH program, all patients were evaluated following the abovementioned scheme at the end of the program (T2) and at 6 months (T6m).

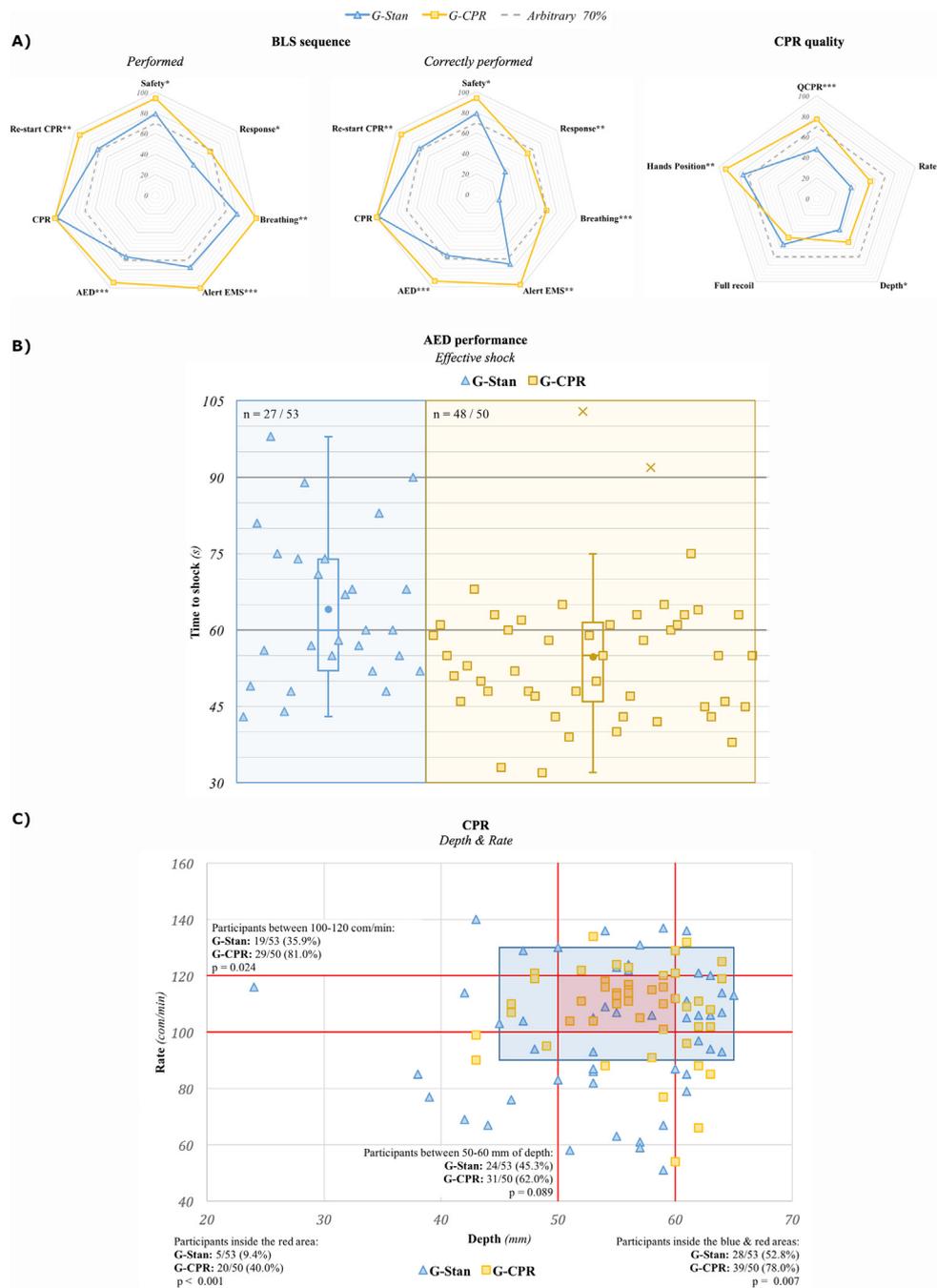
Fifty-three participants of G-Stan and 50 participants of G-CPR were evaluated at T6m. Results of T0, T1 and T2 have already been reported.<sup>1,2</sup> Results of both groups' performance at T6m are shown in Fig. 1, and Supplementary material 1. G-CPR remembered and performed better all the steps of the BLS sequence, except for

“starting CPR”, where both groups achieve comparable proficiency. Additionally, a higher percentage of G-CPR participants performed all the six steps and in the correct order at this point ( $p < 0.001$  in both cases). With respect to defibrillation, 48 out of 50 patients in G-CPR delivered an effective shock in less time than G-Stan participants, with almost three quarters of G-CPR participants achieving it below the minute.

G-CPR attained significantly better scores for most individual components of CPR, including adequate compression depth, rate and hands position, as well as better global CPR quality (QCPR). Detailed performance of compression depth and rate and their relationship are depicted in the inferior panel of Fig. 1. 40% of participants in G-CPR and 9.4% in G-Stan met the recommended range of depth and rate, respectively ( $p < 0.001$ ). Furthermore, when a surrounding area comprising values close to the recommendations – 45–65 mm for depth and 90–130 com/min for rate – was delimited, a greater percentage of G-CPR participants kept close to the goals ( $p = 0.007$ ).

Concerning attitudinal aspects, G-CPR participants felt themselves better prepared than G-Stan in terms of BLS and CPR quality. In contrast, participants in both groups were equally willing to use an AED in case of OHCA.

CRH has proven an ideal setting to train patients in BLS. Merging CPR training into CRH of patients who suffer an ACS meets the educational core component of these programs,<sup>3</sup> helping to increase patients' health knowledge and restore their confidence.<sup>1,2,4</sup> Moreover, CPR refreshers integrated in the exercise training helped to prevent BLS skill deterioration at 6 months and enhance their



**Fig. 1 – Results at six months of: (A) BLS sequence (% of participants who performed each step) and CPR quality (in % of compressions); (B) AED (time to shock of participants who delivered an effective shock); (C) depth and rate of CPR of each participant. Regarding (C), values meeting the recommendations are included in the red ‘target’ area; values close to the standards are located in the surrounding blue ‘borderline’ area (45–65 mm for depth and 90–130 com/min for rate). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article).**

**In section (A): \*p < 0.05, \*\*p < 0.001, \*\*\*p < 0.001.**

confidence. Hence, implementing this model could contribute to increase the number of bystander responders in OHCA and maintain their BLS skills over time.

## Conflicts of interest

None.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.resuscitation.2019.03.049>.

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