

## Physical Exercise Combined With CPAP Improves Functional Capacity

To the Editor:

We would like to address the issues raised regarding the paper entitled "Physical Exercise Combined With CPAP in Subjects Who Underwent Surgical Myocardial Revascularization: A Randomized Clinical Trial," published in *RESPIRATORY CARE*.

The primary and secondary outcomes are described in the Outcomes section. The primary outcome in our study was the 6-min walk test (6MWT). The statistical test for each variable is described in the legends of the tables. Table 4 displays the pre- and post-intervention comparison between the step group and the intervention group, in which a difference in the intragroup mean and its percentage was reported. Moreover, significant differences were described regarding the change in the before and after distances on the 6MWT between the 2 groups. Table 4 displays the intragroup and intergroup *P* values. In the analysis of both groups in the preoperative period compared to the postoperative period, the intervention group had a nonsignificant reduction of only 18% ( $P = .01$ ) in the distance traveled on the 6MWT, whereas the step group had a significant reduction of 38% ( $P \leq .001$ ). The smaller reduction in the distance on the 6MWT indicates that the intervention group had an improvement in functional capacity. A similar study, which involved an intervention with training on a cycle ergometer, reported a similar result regarding the maintenance of functional capacity and a significant reduction in the distance traveled on the 6MWT in the control group.<sup>1</sup> It should be stressed that the

reduction in functional capacity on the 6MWT was seen in heart surgery subjects and can be identified in the control groups.<sup>2</sup> If an intervention such as the one used in our study diminishes this reduction, then the intervention exerted a protective effect and a positive influence, demonstrating its effectiveness.

The sample size was calculated based on the distance traveled on the 6MWT in the study by Trevisan et al<sup>3</sup> and assuming that the subjects following the step program had stable 6MWT results. We estimated a sample size of 15 subjects per group to achieve a statistical power of 80% to detect a 10% difference in the distance traveled. There are few published studies that have performed an analysis of physiotherapeutic protocols in the first phase of cardiovascular rehabilitation, which justifies the use of a study published in 2015 for the calculation of the sample size.

Regarding the second question, the flow chart in Figure 1 of our paper shows the number of patients who were excluded and the reasons for exclusion: 1 patient declined to participate, 8 patients did not meet the inclusion criteria, and 8 patients were excluded for other reasons specified in the exclusion criteria, such as not being able to understand and follow the study protocols or had complications (eg, atrial fibrillation, prolonged mechanical ventilation, or death) in the postoperative period.

Upon being excluded from the study, no follow-up was performed with these individuals because the objective of the study was to compare the step group and intervention group with a cycle ergometer and CPAP. Table 3 presents the data on surgical duration, number of bypasses, duration of ventilation, and length of ICU stay and hospital stay of the study subjects.

Table 1 displays the comorbidities diagnosed in both groups of subjects. Anemia and kidney failure were not reported because none of the subjects had a diagnosis of these conditions at the time of evaluation. Regarding the lung function test, this is not a routine exam solicited as a preoperative evaluation criterion. Moreover, extracorporeal circulation time was not a determinant of the study outcome because the mean in both groups was similar, with no statistically significant difference (control group: 72 ±

18 min; experimental group: 70 ± 19 min,  $P = .76$ ).

Therefore, we reaffirm our conclusions that physical exercise on a cycle ergometer combined with CPAP as an adjunct to the rehabilitation of hospitalized subjects having undergone myocardial revascularization with CABG was safe, decreased the length of stay in the ICU, and significantly improve reduced functional capacity. The importance of studies similar to our investigation will help underscore the role of rehabilitation for patients who undergo major intervention and require care. Physical rehabilitation proves to have increasingly more benefits for these patients.

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The authors have disclosed no conflicts of interest.

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## EXERCISE AND CPAP SIGNIFICANTLY IMPROVE REDUCED FUNCTIONAL CAPACITY

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