

Does Physical Exercise Combined with Continuous Positive Airway Pressure Improve Functional Capacity?

To the Editor:

We read with great interest the paper describing the randomized controlled trial performed by Windmüller et al,¹ in which they investigated the effect of physical exercise combined with CPAP in cardiac bypass surgery. They reported that a combination of physical exercise and CPAP increased pre- and postoperative distance covered in the 6-min walk test (6MWT) and the length of stay in the ICU among subjects undergoing coronary artery bypass graft surgery. However, we have 3 concerns regarding the primary outcome and exclusion criteria of the study.

First, the authors should report the primary outcome correctly in the statistical analysis and clarify the method used to calculate the sample size. The primary outcome of this study was the distance walked during the 6MWT. Postoperative 6MWT distance was not significantly different between the intervention and control groups. Even if the authors wish to compare the maximum distance traveled in meters evaluated in the 6MWT before and after intervention as described in the protocol, the *P* value of the mean of the difference between the groups was not provided

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in Table 4. The authors should provide the statistical differences in the change in the before and after 6MWT distances between the 2 groups. Moreover, the method of calculating the sample size was unclear. We would like to know whether the authors calculated the sample size based on the postoperative 6MWT distance or the difference in the 6MWT distance measured preoperatively and on postoperative day 4, which differs from the evaluation done on postoperative days 3 and 6 in the previous report that was used as the basis for this decision.²

Second, little information was provided regarding the number of patients excluded based on the inclusion and exclusion criteria. The protocol stated that the subjects included in the study had “no postoperative complications that delay hospital discharge for > 8 d of hospitalization.” It is difficult to judge whether the subjects experienced postoperative complications and if they were discharged after > 8 d of hospitalization during randomization. Therefore, it is important to clarify the details of postoperative complications of all subjects enrolled and the clinical data (eg, the length of stay in the ICU and in the hospital) of excluded patients. Clarifying the definition and details of postoperative complications will facilitate better understanding of the study.

Third, the authors need to supplement the information concerning the factors associated with the distance covered in the 6MWT. The baseline variables demonstrated in Table 1 did not include important variables related to 6MWT distance as follows: renal insufficiency, anemia, pulmonary function, brain natriuretic peptide, and the duration of cardiopulmonary bypass during surgery.^{3,4} The duration of cardiopulmonary bypass influences the decrease in the 6MWT distance in patients

who undergo cardiac surgery⁴ and the increased incidence of postoperative complications.^{4,5}

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