Letter by Tomczak and Haykowsky Regarding Article, “Discrepancy Between Cardiac and Physical Functional Reserves in Stroke”

To the Editor:

Jakovljevic et al.1 recently reported that peak cardiac output was not significantly different between patients with stroke and healthy control subjects despite a 31% lower peak oxygen uptake (VO$_2$) in patients with stroke. The authors1 attributed the latter to different exercise modalities and cardiac output estimation. Subsequently, the authors’ recommendation for rehabilitation strategies “targeting muscle oxygen uptake” in light of their statement that “cardiac function and pumping capability are maintained”1 warrants caution, because we have found that peak and reserve cardiovascular function may indeed be impaired in patients with chronic stroke.2

We strongly suggest that stroke rehabilitation should integrate exercise therapy that targets cardiorespiratory, peripheral vascular, and skeletal muscle function (not just skeletal muscle function as the authors’ suggest1) to improve peak VO$_2$ and functional ability.

Disclosures

None.

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In the authors’ study,1 patients with stroke and control subjects completed peak exercise differently (ie, cycle ergometry versus treadmill). Furthermore, data that could provide additional insight about how “maximal” the exercise actually was for control subjects were not provided. We found a greater reduction (43% lower) in peak VO$_2$ for patients with stroke2 than the authors report (31%)1; does this reflect a difference in exercise capacity for participants between studies or is it an effect of the different exercise protocols used by Jakovljevic et al.1 We suspect it is the latter.

The authors estimated cardiac output with different methods between the groups (ie, bioreactance versus CO$_2$ rebreathe).1 Despite the inherent error of each method, the study design “benefit” of systematic error from using only one method that would be present in both groups is lost. The authors’ findings and conclusions are confounded by using different methods for cardiac output estimation. Subsequently, the authors’ recommendation for rehabilitation strategies “targeting muscle oxygen uptake” in light of their statement that “cardiac function and pumping capability are maintained”1 warrants caution, because we have found that peak and reserve cardiovascular function may indeed be impaired in patients with chronic stroke.2

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