

CORRESPONDENCE

Efficacy of lower-limb muscle training modalities in severely dyspnoeic individuals with COPD and quadriceps muscle weakness: results from the DICES trial

Finding an effective rehabilitative modality that does not evoke severe dyspnoea is indeed of great interest to clinicians. The DICES trial aims to identify the optimal training modality by studying the efficacy of high-frequency neuromuscular electrical stimulation (NMES), and low-frequency NMES or strength training in severely dyspnoeic individuals with COPD with quadriceps muscle weakness at baseline. We have some queries regarding the data analysis employed by Sillen *et al.*¹

A power calculation is described in the online supplement which is based on a between-group (intervention vs control) difference of 9.2 kg. With a 5% significance level and power of 80%, the required sample size is 36 per group, plus an allowance for withdrawals. This power calculation is based on previous work by O'Shea *et al.*² which compared a strength training intervention with a non-training control group. The DICES trial on the other hand compares the outcome of three different interventions, with no control. The between-group difference when comparing three interventions might reasonably be assumed to be much smaller than 9.2 kg. Alongside the effect size question, the addition of a third group leads us to question the validity of the power calculation for this trial.

Despite specific mention of a control group in the online supplement, the main paper has no mention of a control group and, in fact, the authors highlight this as a methodological limitation. There is also some confusion over the units used to measure strength with the power calculation using mass (kg) and the results reported as a torque (Nm). Clarification is needed of how the numbers in the power calculation transform to be comparable with the results.

The authors conclude that high-frequency NMES is 'equally effective' as strength training in strengthening quadriceps in this population. With this sample size, a between-group difference would only be detected if the effect size was 9.2 kg or greater. Although the DICES

trial did not detect a statistically significant difference between high-frequency NMES and strength training, there may have been a smaller, but still clinically important difference which this study was not sensitive enough to detect. The data presented do not support the rejection of the null hypothesis. It can only be stated that they were unable to prove that the two interventions were different. The authors, therefore, cannot conclude equivalence, and caution should be exercised before applying these findings in a clinical setting.

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