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P170

Is threshold useful in accelerating weaning from mechanical ventilation?

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Introduction Threshold can be used as a physiotherapeutic tool in order to increase muscle strength, and this effect can be useful in weaning patients. However, there are still controversies considering its advantages during weaning from mechanical ventilation (MV). The goal of this study is to evaluate its effects in such a situation.

Methods Patients under MV for more than 48 hours and prone to weaning were studied. They were randomized to the control group or to the threshold group and followed daily until extubation, tracheostomy or death. The threshold group was trained twice daily. All cardiorespiratory variables, maximal inspiratory (PI_{max}) and expiratory (PE_{max}) pressures were registered twice daily during the observation period. The length of weaning and success or failure were registered. Variables were compared by analysis of variance, Mann–Whitney U test and the chi-square test. Results are shown as the median, mean and standard deviation or as percentages. The significance level was $P < 0.05$.

Results Sixty patients were studied (52% men, mean age 64 ± 17 years, 18% with chronic obstructive pulmonary disease in threshold group vs 15% in control group). Comparing initial versus final cardiorespiratory variables in both groups, no important differences were observed with exception of PI_{max} (increased from -33.5 ± 14.4 to -40.2 ± 13.4 cmH₂O in threshold group and changed from -37.1 ± 9.8 to -34.4 ± 9.6 cmH₂O in control group, $P < 0.05$) and PE_{max} (increased from 24.7 ± 12.7 to 29.4 ± 12.1 cmH₂O in threshold group and changed from 30.9 ± 13.5 to 27.1 ± 9.4 cmH₂O in control group, $P < 0.05$). No reduction was observed in the length of weaning (1.87 days with threshold versus 1.98 days in control group, $P > 0.05$). There was no difference concerning weaning success (73.5% with threshold versus 61.5% in control group, $P > 0.05$).

Conclusions Threshold during weaning from MV can cause an increase in both PI_{max} and PE_{max} but, at least in these preliminary results, it was not associated with a decrease in length of weaning or an increase in weaning success.