



Water-based exercise is more effective than land-based exercise for people with COPD and physical comorbidities

Synopsis

Summary of: McNamara RJ, et al. Water-based exercise in COPD with physical comorbidities: A randomised controlled trial. *Eur Respir J* 2013; 41:1284–1291. [Prepared by Kylie Hill, CAP editor.]

Question: In patients with chronic obstructive pulmonary disease (COPD) who have physical comorbidities, is water-based exercise more effective than land-based exercise for improving exercise capacity and health-related quality of life (HRQoL)?

Design: Randomised controlled trial with concealed allocation and blinding of outcome assessors. **Setting:** The outpatient department or hydrotherapy pool of a hospital in Sydney, Australia. **Participants:** Adults with stable COPD were included if they had at least one physical comorbid condition that was likely to compromise their capacity to participate in land-based exercise (eg, musculoskeletal conditions, peripheral vascular disease, neurological conditions or body mass index ≥ 32 kg/m²). Exclusion criteria were unstable cardiac disease or a contraindication to water-based exercise, such as open wounds or incontinence. Randomisation allocated 18 participants to the water-based exercise (WBE) group, 20 to the land-based exercise (LBE) group and 15 to the control

group. **Interventions:** Both WBE and LBE required participants to attend three 60-minute sessions each week, for 8 weeks. The WBE group and LBE group were matched as closely as possible in terms of intensity and the muscle groups exercised. Intensity was titrated to achieve moderate dyspnoea. Those in the control group continued with usual medical care. **Outcome measures:** The primary outcome was exercise capacity measured using the endurance shuttle walk test (ESWT) at 8 weeks. **Results:** A total of 45 participants completed the study. On completion of the training period, compared with the control group, greater gains were seen in the distance walked during the ESWT in the WBE group (309 m, 95% CI, 96 to 522 m) but not in the LBE group (81 m, 95% CI, –136 m to 297 m). The gains seen in the WBE group were also greater than those seen on the LBE group (228 m, 95% CI, 19 to 438 m). Similar results were demonstrated for the distance achieved during the incremental shuttle walk test and the fatigue domain of the Chronic Respiratory Disease Questionnaire (ie, a domain of HRQoL). **Conclusion:** In people with COPD and physical comorbidities, WBE appears to confer greater gains in exercise capacity and fatigue, when compared with LBE.

Commentary

Pulmonary rehabilitation is effective at improving exercise capacity and HRQoL, therefore it is recommended for patients with COPD.¹ However, one-third of the patients decline participation² and the dropout rate from programs is fairly high. Comorbid conditions are one reason why patients have difficulty participating in exercise training. In previous studies that investigated the effect of exercise training, physical comorbidities were also common exclusion criteria. Cristafulli et al³ reported that more than half of all patients with COPD have one or more comorbidities, a consideration that may compromise the generalisability of results of previous studies.

McNamara et al illuminate this issue in their well-designed study. They showed that water-based exercise, performed at moderate intensity, is not only feasible for patients with COPD with physical comorbidities, but also more effective than land-based exercise. One thing that might explain the superiority of water-based exercise versus land-based exercise is that the self-reported intensity was higher in the water-based group (1.5 units and 1.0 unit in dyspnoea and exertion ratings, respectively). Agostini et al⁴ found that functional residual capacity (FRC) and residual volume (RV) are decreased by head-out water immersion in

healthy persons. If this is also the case for patients with COPD, a reduction in hyperinflation may have allowed a higher training intensity to be achieved during water-based exercise. The results can, as the authors state, only be generalised to patients with moderate COPD. However, the study adds to the body of knowledge in a very important way by including patients with co-morbidities and by showing that this large group of patients can gain considerably from exercise training performed in water. Further studies investigating the long-term effect and compliance to treatment should be performed.

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References

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