Treadmill training more effective than Bobath training in improving walking following stroke

Synopsis

Summary of Eich HJ, Mach H, Werner C and Hesse S (2004): Aerobic treadmill plus Bobath walking training improves walking in subacute stroke A randomized controlled trial. *Clinical Rehabilitation* 18: 640–651. (Prepared by Mark Elkins, CAP Editor.)

Question After recent stroke, does six weeks of aerobic treadmill training increase maximum walking speed and capacity more than Bobath walking training? ***Design*** Randomised, controlled trial with concealed allocation. ***Setting*** Rehabilitation unit. ***Patients*** Fifty patients were recruited within six weeks of their first supratentorial stroke. Eligibility criteria included ability to walk 12 m with intermittent help or stand-by, 50 to 75 years of age, a Barthel Index of 50 to 80, and participation in a 12-week rehabilitation program. Twenty-five patients were randomised to the treatment group and 25 to the control group. ***Interventions*** Each patient received 60 min of individual physiotherapy time per week day for six weeks. For patients in the treatment group, therapy consisted of 30 min of treadmill training and 30 min of Bobath walking training. During treadmill training, patients wore a harness to prevent falls and exercised at 60% of their heart rate reserve. Patients in the control group received 60 min of Bobath walking training. Other aspects of the rehabilitation programme were maintained in both groups according to individual needs. ***Outcomes*** The primary outcomes were walking speed and capacity, measured at the end of the six week program and 12 weeks later. Speed was taken as the average of two trials of walking 10 m at maximum speed. Capacity was assessed using the six minute walk test. Secondary outcomes included gross motor functions and walking quality. ***Results*** From baseline to six weeks, speed increased 0.15 m/sec (95% CI 0.12 to 0.18) and capacity increased 34.9 m (95% CI 14.8 to 55) more in the treatment group than in the control group. From baseline to 12 weeks post-program, speed increased 0.22 m/sec (95% CI 0.12 to 0.32) and capacity increased 54.3 m (95% CI 29.8 to 78.2) more in the treatment group than in the control group. Secondary outcomes did not differ significantly at any time between groups. ***Conclusion*** Treadmill training induces greater improvements in walking speed and distance than Bobath walking training in patients with moderate physical disability due to recent first stroke.

Commentary

This trial makes a substantial contribution to the evaluation of treadmill training with body weight support for walking after stroke. Having recruited 50 people with stroke, it is adequately powered to detect clinically worthwhile effects. The trial also incorporates design features to minimise bias in the results, achieving a PEDro score of 8/10. This is actually the highest possible score for this type of trial, as it is not possible to blind the subjects or therapists (Maher et al 2003). The treatment effects were both statistically significant and clinically worthwhile. The trial has been included in the update of the Cochrane systematic review on this topic (Moseley et al 2005). While there were no statistical differences detected in the meta-analysis, significant effects in two (Eich et al 2004, Pohl et al 2002) of the five trials recruiting independent walkers are likely to be due to the intensity of the treadmill training protocols.

Some key features of the treadmill intervention included: cardiovascular screening, using a modified parachute harness secured to an overhead support system to prevent falls, adjusting both the speed and inclination of the treadmill to achieve a training heart rate, monitoring heart rate during training, and repeated exposure to this training. While treadmill and body weight support equipment are now commonly available in rehabilitation units in Australia, most training occurs with the treadmill horizontal. Increasing the treadmill slope and using portable heart rate monitors during therapy may optimise the treadmill training currently provided. The 6-minute walk test or fast-paced 10-metre walk test could be used to monitor clinical outcomes.

Interestingly, the size of the treatment effect increased during the follow-up period. One possible explanation is that the gains in walking speed and capacity during the intervention phase allowed the subjects to participate more in instrumental activities of daily living, work, and leisure, and that this increased participation provided sufficient stimulus to further improve fitness. Unfortunately, because participation was not quantified, one can only hypothesise about this relationship.

Anne Moseley
School of Physiotherapy, University of Sydney

References

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Moseley AM et al (2005): *Cochrane Library*, Issue 4.

Pohl M et al (2002): *Stroke* 33: 553–538.