Dynamic neck muscle training or relaxation does not improve chronic neck pain

Synopsis

Summary of Viljanen M, Malmivaara A, Uitti J, Rinne M, Palmroos P and Laippala P (2003): Effectiveness of dynamic muscle training, relaxation training, or ordinary activity for chronic neck pain: Randomised controlled trial. *British Medical Journal* 327: 475–479. [Prepared by Pierre Trudelle, Chief editor of *Kinésithérapie*, France.]

Question: Do dynamic exercises or relaxation improve chronic neck pain in comparison with ordinary activity? ***Design:*** Randomised controlled trial. ***Setting:*** Five Finnish occupational health care centres. ***Patients:*** 393 female office workers (aged between 30 and 60 years, mean age 45 years) suffering from chronic neck pain for at least 12 weeks. The patients were randomised in three groups "dynamic muscle training" (n = 135), "relaxation training" (n = 128) and "ordinary activity" (n = 130). ***Interventions:*** The dynamic muscle training and relaxation interventions were administered by a physiotherapist to groups of up to 10 people, 3 times a week for 12 weeks. The dynamic muscle training group performed exercises with dumbbells to activate the large muscle groups in the neck and shoulder region. The relaxation group used the techniques of autogenic training and functional relaxation to learn to activate only the muscles required for functional tasks. The ordinary activity group were asked not to change their physical activity over the next 12 months. ***Outcomes:*** The primary outcome was pain intensity (0 to 10 scale), secondary outcomes included disability, work ability, range of motion, muscle strength, sick leave and patient's opinion of recovery. ***Results:*** Loss to follow-up was 9%, 11% and 13% at 3, 6 and 12 months, however only 40% of patients completed all treatment sessions. There were no statistically significant or clinically meaningful between-group differences in pain intensity at any point. As an example at 3 months the mean (95% CI) between-group difference was 0.2 (-0.4 to 0.7) for dynamic muscle training versus usual activity and 0.1 (-0.4 to 0.7) for relaxation versus usual activity. There were also no between-group differences for the secondary outcomes with the exception of rotation and lateral flexion range of motion. ***Conclusion:*** Dynamic muscle training and relaxation do not lead to better improvements in neck pain compared to the advice to live normally.

Commentary

The study is methodologically sound but the outcomes are perhaps too limited to find an effect of treatment. For example, the strength outcome measured endurance yet the training program emphasised dynamic movements and not endurance. Also, it is unclear whether the initial level of strength was limited by pain. The cervicocephalic kinaesthetic sensibility was not evaluated although it is an important measurement when evaluating neck muscle disorders. Another interesting evaluation would be the joint laxity characteristics (Beighton's score), as women are often more supple than men.

Another potential explanation for the null result is that the exercise program may have been sub-optimal and previous trials (Ylinen et al 2003; Hasberg et al 2000) also evaluating female office workers with chronic neck pain provide some information on this issue. In contrast to the result of the present trial the Ylinen et al (2003) trial, comparing two forms of exercise to a no-treatment control, found large benefits of exercise for women with chronic neck pain. The strength increases were different among all 3 groups ($p < 0.001$) and neck pain and disability had decreased in the training groups compared to the control group ($p < 0.001$). This contradictory result can be explained by the fact that the two exercise programs evaluated by Ylinen et al were much more comprehensive than that of Viljanen et al. Ylinen's programs trained neck muscles as well as shoulder muscles, included an aerobic training component, provided behavioural support, and the duration of the exercise program was longer. The Ylinen et al program included specific training of the neck flexors and extensors supervised for 12 weeks (approximately 2 sessions by week) and then patients continued independently for one year. Other research supports a more comprehensive approach with Hagberg's (2000) trial suggesting that the exercise program should include both strength and endurance training.

In conclusion while this trial did not find a benefit for exercise in the treatment of chronic neck pain, other trials have. Additionally, the Cochrane review advocates exercise in the treatment of chronic neck pain (Gross 2001).

François Bregeon

Physiotherapist, Paris

References

Hagberg M et al (2000): *Archives of Physical Medicine and Rehabilitation* 81:1051–1058.

Ylinen J et al (2003): *Journal of the American Medical Association* 289: 2509–2516.

Gross AR et al (2001): Cochrane Library, Issue 4.

Community-based rehabilitation improves function of patients with traumatic brain injury

Synopsis

Summary of Powell J, Heslin J and Greenwood R (2002): Community-based rehabilitation after severe traumatic brain injury: A randomised controlled trial. *Journal of Neurology, Neurosurgery and Psychiatry* 72: 150–151. [Prepared by Karen Grimmer, member Editorial Board, Australian Journal of Physiotherapy.]

***Question*:** Do participants in a community outreach program for traumatic brain injury (TBI) make greater gains in independence in activities of daily living, social participation and psychological wellbeing than those receiving information only about alternative sources of assistance? ***Design*:** Randomised single blind controlled trial. ***Setting*:** Community settings in the suburbs of East London (patients' homes, day centres, workplaces). ***Patients*:** 110 patients aged 16 to 65 years, having suffered TBI between 3 months and 20 years previously, randomly allocated into treatment (54 patients) and controls (56 patients). Sixteen patients were lost to follow-up. ***Interventions*:** Multidisciplinary team comprising physiotherapists, occupational therapists, clinical psychologists, speech pathologist, social workers (who had input as appropriate). All participants received one home visit from a team member, who provided and discussed a comprehensive resource booklet about local and national services for TBI. Intervention group thereafter also received individualised rehabilitation programs (based on need) provided by appropriate team members, on average twice weekly for up to 40 weeks. All participants were followed up between 18 and 40 months later. ***Outcomes*:** Primary outcome measures assessed levels of functional activity and participation (Barthel Index, Brain Injury Community Rehabilitation Outcome [BICRO]-39). Secondary measures were functional assessment and independence (FIM-FAM), and in a subset, hospital anxiety and depression scale. ***Results*:** Significantly greater percent improvements ($p < 0.05$) were found in Barthel Index for the intervention group(35.4%, SD 17) compared with the control (19.6%, SD 9), and total BICRO-39 scores (intervention 80%, SD 28; control 70%, SD 28). Significant improvements were also found for the BICRO-39 subscales of self organisation and psychological wellbeing. There were no other convincing improvements. Time since injury was not related to improvement. ***Conclusion*:** Community-based rehabilitation for patients with TBI significantly improves functional activity and participation even when provided years after injury.

Commentary

This is a necessary and well reported study. It provides initial information that confirms long held anecdotal beliefs and low level evidence that community-based outreach services can enhance a variety of outcomes following traumatic brain injury, irrespective of the time period post injury. Given continued decreases in inpatient rehabilitation time, and increasingly early discharge to home (for often financial reasons) it has become urgent to investigate the efficacy of community-based rehabilitation services in the post-acute phase. At the time of its publication, such a trial of essentially intervention versus information only had not been performed in an ethical climate. (Ethical research usually does not support the withholding of treatment.)

The results can be viewed as conservative in some respects, yet clearly demonstrate that this community-based outreach service offered (statistically and clinically significant) greater improvement in areas such as mobility, personal care, self organisation and psychological wellbeing as compared to the group who received information only. The reason for lack of differential change in indices of socialisation and employment could be hypothesised as these areas requiring more sustained input as well as having a higher level of uncontrollable external/societal factors that cannot be influenced by a community outreach team.

Of interest was that time post injury did not influence potential for change — in fact there was a weak correlation suggesting increased time post injury was associated with increased gains. So it is time to put the hoary old chestnut of "recovery only occurring in the first year" to bed! The follow-up period for re-assessment indicated strongly that improvements made were sustained. This study was investigating the efficacy of the overall package rather than specific components and hence the conclusions reflect that broader perspective.

This is long overdue evidence with which we can move forward with our multidisciplinary, community based, outreach services for people with TBI, having greater confidence that this input can significantly enhance functional improvement.

Susan Hillier

Centre for Allied Health Evidence (a collaborating centre of the Joanna Briggs Institute), University of South Australia

Treadmill training and/or body weight support may not improve walking ability following stroke

Synopsis

Summary of Moseley AM, Stark A, Cameron ID and Pollock A (2003): Treadmill training and body weight support for walking after stroke. The Cochrane Library, Issue 3. Oxford: Update Software. [Prepared by Gro Jamtvedt and Kåre Birger Hagen, Norwegian Directorate for Health and Social Welfare.]

Question: Does treadmill training and/or body weight support improve walking ability in people who have suffered a stroke? ***Design:*** Systematic review of randomised, quasi-randomised or controlled trials. ***Setting/population:*** Adults who had suffered a stroke and exhibited an abnormal gait pattern. ***Interventions:*** Treadmill training involving walking on a standard treadmill, assistance, feedback or guidance provided by a health professional (usually a physiotherapist). Some of the patient's body weight may be supported during this training using a harness attached to an overhead support system. Alternately, this type of body weight support can be used without a treadmill. ***Outcomes*:** Ability to walk indoors (with or without a gait aid) without personal assistance or supervision (scored as yes/no), data from functional scales or parts of functional scales relating to walking, and independent walking speed and walking endurance. ***Results:*** 11 studies (458 participants) were included. The mean quality score was 6 out of 10 on the PEDro scale (range from 4 to 8). There were no statistically significant differences between treadmill training, with or without body weight support, and other interventions for walking speed or dependence. There was a small trend toward the effectiveness of treadmill training for speed with body weight support for participants who could walk independently (weighted mean difference: 0.24 m/sec, 95% CI 0.19 to 0.66 for speed; random effects). The one trial which compared treadmill training with and without body weight support showed benefit at the end of follow-up (weighted mean difference 0.22 m/sec, 95% CI 0.05 to 0.39). Adverse events occurred slightly more frequently in participants receiving treadmill training, although statistically there were no differences. ***Conclusion*:** Overall, no statistically significant effect of treadmill training and body weight support was detected. However, among people who could walk independently, treadmill training with body weight support appeared to be more effective than other interventions at improving walking speed, but this conclusion was not robust.

Commentary

Walking on treadmill using a harness connected to an overhead support system or walking unsupported are gait training methods that have become increasingly popular. These interventions are costly in terms of equipment and human resources, and research highlighting the effect of treadmill training is therefore welcome. The systematic review concludes that treadmill training is at least as effective as other gait interventions but that more research is needed to determine whether this training is more efficient than other gait training. The analyses are performed conservatively, where improvements that did not lead to free walking during the intervention were not regarded as improvement.

Treadmill training may have limitations. Walking on a treadmill is different from over ground walking, which was how walking was assessed, and this may explain why the effect of treadmill training was not better than other gait training. Walking on a treadmill with a harness probably does not improve the balance component of walking. Thus, when balance limits walking ability, it is likely that supported walking is not optimal training.

Despite the non-conclusive results, there may be reasons to use treadmill training in the clinic. Higher dosage of training is possible for persons with limited walking function. The review did not assess the gains of supported treadmill training for persons with severe sequelae after stroke or head injury when subjects are not able to walk even with support from walking aids or from other persons. For these people supported treadmill walking may be the only alternative, and may also be important for preventing cardiovascular and musculoskeletal complications due to inactivity.

Until more robust evidence is available, treadmill training may be seen as a supplement to gait training for some groups of patients for whom over ground walking is restricted by their walking ability.

Jorunn L Helbostad

Section of Physiotherapy Science, University of Bergen, Norway