Support for physical activity improves strength and perceived health in adults with rheumatoid arthritis

Synopsis


**Question:** What is the effect of a support program for healthy physical activity for patients with early rheumatoid arthritis (RA)?** Design:** A multicentre randomised controlled trial with assessor blinding. **Setting:** 10 hospital rheumatology clinics in Sweden. **Participants:** 228 adult patients with RA meeting American College of Rheumatology criteria, of which 94 were randomised to coaching and 134 to treatment as usual. **Interventions:** The intervention group underwent a 1-year program of support to undertake physical activity of moderate intensity, 30 minutes/day, at least 4 days/week. The support program involved individual coaching by a physiotherapist trained in cognitive-behavioural techniques. Goals for physical activity were formulated and documented according to a structured manual based on the principles of graded activity training. Telephone support was given by the physiotherapist at 1 week and then once a month. Tests of muscle function, joint range of motion, and balance were performed every third month. Participants in both groups had access to, but were not specifically encouraged to participate in, standard physiotherapy treatment including patient education, treatment with physical modalities, and organised exercise sessions twice per week. **Outcomes:** The primary outcome was the EuroQol visual analogue scale (VAS) (0–100), which assessed perceived health. Secondary outcomes included maximum grip strength, the Timed-Stands Test of lower extremity function, general joint range of motion, walking in a figure of 8, and ratings of pain and disability, measured at one year follow-up. **Results:** After 1 year 18% in the intervention group and 13% in the control group were lost to follow up. There was no statistically significant difference in fulfilling the recommended level of physical activity (54% in the intervention group versus 44% in the control group). Median improvement in the EuroQol VAS was 5 in the intervention group versus 0 in the control group (p = 0.027). Also grip strength and the Timed-Stands Test improved significantly more in the intervention group (p < 0.01). **Conclusion:** A 1-year support program to perform healthy levels of physical activity resulted in small improvements in perceived health status and muscle strength. However, the underlying mechanisms remain unclear, as self-reported levels of physical activity did not increase.

Commentary

The health benefits of physical activity for the general population are well known. Despite this, the level of physical activity for many people is lower than current recommendations. Guidelines for the management of RA recommend physical activity in order to maintain or improve physical function (American College of Rheumatology 2002) but, compared to the general population, even lower levels of physical activity are reported by patients with RA (Sokka et al 2008). In order to improve physical function, several studies stress the need for physiotherapists to motivate patients to increase physical activity level (Sokka et al 2008, van den Berg et al 2007, Eurenius and Stenström 2008). The present study demonstrates that promoting physical activity also improves perceived health status, thus strengthening the value of this intervention for patients with RA.

In daily practice physiotherapists need a variety of methods in order to support individual patients to reach the recommended level of physical activity. This well-conducted, multi-centre study involved 23 physiotherapists who prior to the intervention underwent 1-day training in coaching. The intervention consisted of one individual consultation with information, discussions of obstacles, and goal setting for graded activity training, followed by monthly telephone calls for support. This is probably feasible in other settings after local adaptations.

The intervention group improved strength and perceived general well-being in accordance with the hypothesis of the study, but the groups did not differ significantly in physical activity level at 1 year. The authors discuss several plausible explanations for this, including that the intervention group showed learning effects, were advised about a wider range of exercise intensity and therefore rated their own exercise more harshly, responded to the attention from the physiotherapist, or performed higher quality exercise. Also, because exercise levels were only compared at one year, the groups may have differed earlier in the year.

Coaching long-term behaviour change in physical activity is complex and demanding. The authors of this study stress it is important that physiotherapists evaluate their patients’ physical activity in a structured manner and provide support. Although a lot of questions remain unanswered about the efficacy of this approach, this trial has opened an exciting avenue for physiotherapists treating RA patients.

Camilla Fongen
National Resource Centre for Rehabilitation in Rheumatology, Norway

References


Exercise improves cancer-related fatigue

Synopsis


Objective: To review the evidence as to whether exercise, both during and after cancer treatment, improves cancer-related fatigue in adults. Data sources: The Cochrane Controlled Trials Register, MEDLINE, EMBASE, CINAHL, British Nursing Index, AMED, SIGLE, and Dissertation Abstracts International were searched to July 2007. This search was supplemented by hand searching relevant journals and contacting experts. Study selection: Randomised controlled trials that investigated the effect of exercise on cancer-related fatigue in adults. The primary outcome measure was fatigue, and secondary outcome measures included aerobic capacity/cardiovascular function, quality of life, body composition, physical activity levels, general mood, depression and anxiety. Data extraction: Two review authors independently assessed the methodological quality of studies and extracted data based upon pre-defined criteria. Any discrepancies were reviewed by a third review author to reach consensus. Methodological quality was assessed using the Oxford Quality Scale. Data synthesis: 28 studies were identified for inclusion (n = 2083 participants) in the review. A meta-analysis was used to combine the post-test results of the 28 studies, with 30 comparisons possible due to the inclusion of two intervention groups in two studies. Based on the quantitative pooling of the available data from these trials, 22 comparisons provided data for 920 participants who received an exercise intervention, and 742 participants in the control arm. At the end of the intervention period there was a statistically significant difference in fatigue, in favour of exercise (SMD –0.23, 95% CI –0.33 to –0.13). Exercise was statistically more effective than the control intervention whether it was carried out during cancer treatment (SMD –0.18, 95% CI –0.32 to –0.05) or following cancer treatment (SMD –0.37, 95% CI –0.55 to –0.18). In addition, statistically significant beneficial effects were identified specific to a population with breast cancer (n = 16 studies, 1172 participants). Comparisons were not possible in the remaining secondary outcomes with variations in diagnostic group studied and differences in the quality of the study and data reported. Conclusion: Exercise, both during and after cancer treatment, appears to have some benefit in the management of fatigue, and should therefore be considered as a management strategy.

Commentary

Fatigue is a common symptom experienced by cancer survivors. Cancer-related fatigue (CRF) is distinguishable from normal fatigue in that CRF symptoms are severe, distressing, and unrelieved by sleep and rest (Mock et al 2000, Cellà et al 2001, Stone and Minto 2008). The underlying causes and pathophysiology of CRF are unclear and it has proven to be a difficult symptom to manage. Management strategies include behavioural interventions, pharmacological treatments, and exercise programs (Mock et al 2000, Cellà et al 2001, Stone and Minto 2008).

The overall findings of this review support a small but beneficial effect of exercise in reducing symptoms of CRF. There are a number of issues, however, to consider before drawing conclusions about clinical practice based on this review. First, there was a considerable degree of clinical heterogeneity between studies in terms of type of cancer, mode and intensity of exercise, and timing of the exercise intervention. Furthermore, there was significant statistical heterogeneity identified for a number of comparisons presented in the review. While the authors acknowledge this heterogeneity, they do not elaborate on the potential effect of the clinical and statistical heterogeneity on their findings and conclusions. The individual study findings show variability in effect sizes ranging from small to large and from beneficial to harmful effects. For example, the Thorsen (2005) study (varied cancer population, post treatment, home-based program) showed a potentially harmful effect of 0.37 (95% CI –0.02 to 0.77) from exercise, while the Milne (2008) study (breast cancer, post treatment, supervised aerobic and resistance exercise) showed a large beneficial effect of –1.35 (95% CI –1.92 to –0.78). Thus, the overall finding of a small positive effect of exercise on CRF may be misleading as exercise may prove to be more or less helpful based on the type of cancer, timing of the intervention, and type of exercise program.

The authors acknowledge that few studies focused on fatigue as the primary endpoint in cancer survivors. Consequently, we may have evidence that exercise has a small beneficial effect on fatigue in the general population of cancer survivors but limited evidence that exercise can reduce CRF in cancer survivors with CRF, especially severe CRF. The findings of this review, while providing preliminary evidence in support of exercise, highlight the need for further research in clearly defined cancer populations with CRF.

Margaret L McNeely
Cross Cancer Institute, Edmonton, Canada

References

Continuous positive airway pressure reduces respiratory complications following abdominal surgery

Synopsis


Objective: To review the evidence as to whether continuous positive airway pressure (CPAP) reduces postoperative pulmonary complications compared with standard care in patients undergoing major abdominal surgery. Data sources: OVID version of MEDLINE, EMBASE, CINAHL, and Cochrane Central Register of Controlled Trials, searched to November 2005. This search was supplemented by mail and phone follow up of authors to retrieve mortality data. Study selection: Randomised controlled trials involving adults who underwent elective major abdominal surgery other than abdominal aortic aneurism repair in which CPAP plus standard care (physiotherapy and oxygen therapy) was compared to standard care only. Outcome measures were postoperative pulmonary complications (PPCs), pneumonia, atelectasis, endotracheal intubation, and mortality. Data extraction: Two reviewers extracted data and discrepancies were resolved by consensus. Methodological quality was assessed using a scoring system between 0 and 11 where randomisation, concealment, blinding, patient selection, comparability of groups at baseline, treatment protocol, analysis of confounders, outcome definition, extent of follow-up, and intention-to-treat analyses were scored as 0 if not performed or 1 if performed in the study. Data synthesis: Of 735 studies initially identified by the search, 9 studies with a total of 654 patients met the selection criteria and were included in the review. The mean quality score was 6.2. Based on the quantitative pooling of the available data from these trials, there was a statistically significant reduction in PPCs in favour of CPAP, with a risk reduction of 0.34 (95% CI 0.15 to 0.48). This corresponds to a number needed to treat for one patient to benefit (NNT) of 14 (95% CI 10 to 32). There were also significant reductions in atelectasis: risk reduction 0.25 (95% CI 0.03 to 0.42), NNT of 7 (95% CI 4 to 64) and pneumonia: risk reduction 0.67 (95% CI 0.25 to 0.86), NNT of 18 (95% CI 14 to 49) using CPAP. Only two studies measured intubation and the pooled results showed a significant reduction in the need for intubation with CPAP: risk reduction 0.85 (95% CI 0.34 to 0.97). Too few data were available to calculate meaningful estimates for mortality. There was large variability in the application of both CPAP and standard care within these studies, although they represented an international perspective. Conclusion: The use of CPAP in the early management of patients after abdominal surgery reduces the incidence of PPCs, including atelectasis, pneumonia, and need for re-intubation.

Commentary

This review provides evidence for physiotherapists and other health care practitioners to make decisions concerning the use of postoperative CPAP to reduce PPCs in patients undergoing major abdominal surgery. The included studies are all randomised controlled trials examining adult patients and the outcomes that are assessed are clinically relevant.

The review provides evidence that the addition of postoperative CPAP to a regimen of physiotherapy and oxygen therapy in patients undergoing major abdominal surgery reduces their risk of PPCs, pneumonia, atelectasis, and endotracheal re-intubation. From both a clinical and socioeconomic point of view, this benefit is of significance. The number of patients that need to be treated to prevent one PPC is, however, high at an average of 14. Therefore, a challenge for physiotherapists is to stratify patients before surgery to direct CPAP treatment toward patients who may benefit most from this intervention. Furthermore, in patients who undergo upper abdominal surgery, preoperative physiotherapy may be more effective in reducing PPCs in patients at high risk for developing complications compared with patients at low risk (Dronkers et al 2008, Olsén et al 1997, Chumillas et al 1998).

Although the search strategy is comprehensive and the meta-analysis is sound, several issues warrant further discussion. The first is that data regarding duration of mechanical ventilation have not been described. Postoperative pulmonary dysfunction, including pneumonia, is commonly associated with a longer duration of mechanical ventilation, difficulty weaning the patient, and prolonged hospitalisation (Hunter 2006). Additionally, there is no international consensus about the definition of PPCs. Only the Centers for Disease Control and Prevention used explicit criteria for the definition of pneumonia (Dal Nogare 1994). The use of physician documentation of atelectasis and abnormal breath sounds is subjective and may be confounding the incidence of PPCs. Furthermore, as discussed by the authors, there is no common CPAP treatment regimen used in the studies described.

This well-conducted systematic review supports the use of CPAP in this patient population, particularly in the management of postoperative hypoxemia.

Erik Hulzebos
University Medical Center, Utrecht, The Netherlands

References

Physiotherapy added to GP care results in long-term improvements for sciatica

Synopsis


**Question:** In acute sciatica, does the addition of physiotherapy to general practitioner (GP) care improve patients’ global perceived effect of treatment? **Design:** Randomised controlled trial with block randomisation and concealed allocation. The statistician was blinded to group allocation but participants, physiotherapists, and GPs were not. Eighty-six percent of participants were followed up at one year. Both per protocol and intention-to-treat analyses were performed. **Setting:** Community-based study involving 112 GPs and 33 physiotherapists in Rotterdam, The Netherlands. **Participants:** 135 adults with acute sciatica (lumbosacral radicular syndrome) were included. Those with a history of back surgery in the past 3 years or current indications for surgery were excluded. **Interventions:** Participants in both groups were treated by their GP according to the Dutch College of General Practitioners’ 1996 clinical guideline for lumbosacral radicular syndrome. The intervention group additionally received advice, education, and exercise therapy from a physiotherapist. Participants in both groups received a maximum of nine individual consultations over a 6-week period. **Outcomes:** The primary outcome was Global Perceived Effect (GPE), measured on a 7-point scale ranging from 1 = completely recovered to 7 = vastly worsened. Results were dichotomised such that ‘completely recovered’ and ‘much improved’ were categorised as ‘improved’. Secondary outcomes assessed included: back and leg pain severity (11-point numerical rating scale), self-reported disability (0–24 Roland-Morris Disability questionnaire for sciatica), health status (Short-Form 36 and the Euroqol-5D) and fear of movement (Tampa scale for kinesiophobia). Outcomes were measured at 3, 6, 12, and 52 weeks after randomisation. **Results:** At 12 weeks follow-up, 70% of the intervention group and 62% of the control group reported improvement (absolute risk reduction [ARR] 8%, 95% CI –4 to 20, number needed to treat [NNT] 12.) At 52 weeks follow-up, 79% of the intervention group and 56% of the control group reported improvement (ARR 23%, 95% CI 11 to 35, NNT 4.) The secondary outcomes did not differ between groups significantly. Sub-group analysis indicated that physiotherapy resulted in clinically and statistically significant treatment effects among those with higher disability (Roland-Morris Disability score ≥ 17 at baseline) at both 12 and 52 weeks. **Conclusion:** This study demonstrates that physiotherapy added to GP care for sciatica results in clinically worthwhile improvements in the long-term, particularly for those who present with more severe disability.

[ARRs and 95% CIs calculated by the CAP editor.]

Commentary

Recent reviews have highlighted the lack of good quality evidence upon which to base clinical decision-making with patients who have lumbosacral radicular syndrome (LRS) (Luijsterburg et al 2007). This patient group is not addressed specifically in many current guidelines (van Tulder et al 2006). Therefore, this trial is timely.

The findings, from 135 patients, support other trials that show the tendency for patients in all groups to improve over time. However, more patients perceived themselves to be ‘improved’, in the longer-term, in the group that received active exercise therapy from a physiotherapist. In addition, significantly more patients with higher baseline disability were ‘improved’ in the physiotherapy group, suggesting the need to identify this subgroup of LRS patients before onward referral to physiotherapists. The lack of significant differences between groups on all other measures (leg pain, disability, absence from work, fear of movement) raises questions about whether the sample size was adequate in this trial to show relatively small differences between groups. It also asks what outcomes physiotherapy actually affects. Patients’ overall view of their improvement, as measured by global perceived effect, may be capturing other related constructs such as patient satisfaction with treatment.

A minor issue is that participating GPs (n = 112) invited patients with acute LRS to participate in the trial. Most GPs would have referred only 1 or 2 patients to this trial, introducing potential for recruitment bias. For example, they may have approached patients with particular characteristics and avoided approaching others with more complex or difficult symptoms or case histories. A second issue is that, in this trial, physiotherapy consisted of the provision of advice and information about LRS and exercise therapy, not manual therapy approaches that are recommended for acute back pain in some guidelines.

Overall this trial shows that for some outcomes of relevance to patients, active exercise led by physiotherapists provides more benefit than GP care alone, however, more research is required, particularly with the LRS patient group who have high disability levels.

**Nadine E Foster**

Arthritis Research Campaign National Primary Care Centre, Keele University, UK

References


Exercise training and pyridostigmine each have unique benefits for patients with fibromyalgia

Synopsis


Question: Exercise and the acetylcholine esterase inhibitor, pyridostigmine, increase growth hormone secretion. Do these interventions, alone or in combination, improve pain, tender point count, myalgia scores, and other symptoms in patients with fibromyalgia? Design: Randomised, controlled, factorial trial with concealed allocation. Setting: A university tertiary care centre in the USA. Participants: Adults with fibromyalgia according to American College of Rheumatology criteria. 165 participants were randomised to 4 groups: exercise and pyridostigmine, exercise only, pyridostigmine only, or a control group. Interventions: The exercise regimen involved three group exercise sessions per week for 6 months, consisting of aerobic training for 30 min, strength training for 10 min, flexibility training for 5 min, balance training for 5 min, and relaxation for 10 min. The non-exercise groups received weekly telephone calls to discuss dietary intake and a 2-hour monthly visit, intended to control for the effects of staff contact. The pyridostigmine regimen was 60 mg, three times daily, for 6 months. The non-pyridostigmine groups received placebo tablets as a control condition. Outcome measures: The primary outcomes were pain measured on a 10 cm visual analogue scale (VAS), the number of tender points, and the total myalgic score. Secondary outcome measures included VAS ratings of fatigue, sleep, stiffness, and anxiety; the Beck Depression Index; the Quality of Life Scale; and clinical tests of flexibility, strength/endurance, and balance. Results: 154 participants completed the study. No interaction between the two active interventions was observed. At the end of treatment, neither intervention significantly affected any of the primary outcomes. Exercise significantly improved fatigue, by 1 cm (95% CI 0.3 to 1.7) on the VAS; lower body flexibility, by 4 cm (95% CI 1 to 7) on a seated fingertip-to-toe test; and balance, by 27 sec (95% CI 10 to 42) on a single-leg stance test. Pyridostigmine significantly improved sleep scores, by 1 cm (95% CI 0.3 to 1.8) on the VAS; and anxiety scores, by 1.1 cm (95% CI 0.3 to 2) on the VAS. Conclusion: In people with fibromyalgia, exercise improves fatigue, flexibility, and balance, while pyridostigmine improves sleep and anxiety. When both interventions are used simultaneously, both sets of benefits are obtained.

[95% CIs calculated by the CAP Co-ordinator.]

Commentary

Fibromyalgia is characterised by widespread pain, fatigue, stiffness, disrupted sleep, depression, physical deconditioning, and low pain thresholds at specific anatomic sites, which are termed tender points (Wolfe 1990). Exercise or injections of growth hormone can improve fibromyalgia symptoms (Jones 2006, 2007). As a cheaper alternative to injections of growth hormone, the drug pyridostigmine can be used to stimulate the body’s growth hormone production. This factorial trial sought to determine the benefits of exercise and pyridostigmine, alone or in combination, in patients with fibromyalgia.

This study is of excellent quality, scoring 9/10 on the PEDro scale (Maher 2003), although the points awarded for blinding apply only to the comparison of pyridostigmine and its placebo. The control condition for the exercise comparison would not successfully blind the exercise, but would at least control for the attention from the investigators. Also, the investigators appropriately lowered the usual significance level to 0.01 to account for the large number of outcomes.

Both this study and the Cochrane systematic review of exercise for fibromyalgia (Busch 2007) found that the effect of exercise on pain was almost statistically significant. If this new study is incorporated in the next update of the review, the new meta-analysis may show that exercise significantly improves pain. Furthermore, the Cochrane review found no data on flexibility and strength, so this study adds important information about these outcomes. However, the 4 cm improvement in seated fingertip-to-toe distance is of questionable clinical importance.

Pyridostigmine improved a different set of outcomes: sleep and anxiety. These mutually exclusive benefits of the two interventions suggest that both should be offered to fibromyalgia patients. The lack of an interaction effect confirms that the combined benefit is equivalent to the sum of the benefits of each treatment alone.

As in many long-term trials, patient compliance was disappointing, with ~30% of patients attending less than half the allocated exercise sessions. Compliance with pyridostigmine was higher, but the estimate may have been inflated because it relied on patient reports only. Nevertheless, even with this level of compliance, the results are generally clinically worthwhile.

Cláudio Inácio Couto
Federal University of Sao Paulo, Brazil

References