Synopsis


**Question:** What are the effects of physiotherapy exercise for patients with osteoarthritis after elective primary unilateral total knee arthroplasty? **Data Sources:** AMED, CINAHL, EMBASE, King’s Fund, Medline, Cochrane library, PEDro, and the UK Department of Health national research register, searched up to April 2007. This search was supplemented by handsearching a small number of journals and conference abstracts, as well as scanning the reference lists from relevant articles identified by the search.

**Study selection:** Randomised controlled trials involving patients undergoing elective total knee arthroplasty for osteoarthritis in which organised physiotherapy after discharge from hospital was compared to standard post-discharge management. Outcome measures were function, range of motion, muscle strength, walking speed, and quality of life. **Data extraction:** Two reviewers (masked to the key details of the papers) independently assessed methodological quality on a checklist developed from the CONSORT statement and the Critical Appraisal Skills Programme guidelines and extracted the data. **Results:** Six trials with a total of 614 patients were identified, of which five trials with a total of 554 patients provided data that could be included in the meta-analyses. Trial quality was good overall. The trials compared additional physiotherapy exercises or treatment after discharge with no organised outpatient physiotherapy. The patients in the control groups were expected to continue with traditional home exercise programs: isometric strengthening, range of movement exercises, and gait training. Based on quantitative pooling of three trials at 3 to 4 months follow up, there were statistically significant differences in favour of physiotherapy exercises for function (standardised effect size 0.33, 95% CI 0.07 to 0.58) and range of motion (weighted mean difference 3 degrees, 95% CI 1 to 5). At the same time point, results from two trials indicated no significant difference in quality of life (weighted mean difference 1.7 points, 95% CI –1 to 4.3) or walking speed (standardised effect size 0.27 (95% CI –0.13 to 0.67). None of the trials measured muscle strength. At one year follow up, there were no statistically significant differences in any outcome. **Conclusion:** Additional physiotherapy exercises or treatment after discharge have small to moderate short-term beneficial effects compared to no organised outpatient physiotherapy.

Commentary

Both inpatient and outpatient physiotherapy interventions are used after knee arthroplasty, but their effectiveness is questioned. The duration and intensity of the rehabilitation programs also vary considerably (Roos 2003). Discharge from physiotherapy typically occurs when impairments in range of motion and pain resolve, while criteria such as quadriceps muscle strength or performance-based disability measures are rarely used.

This well-performed systematic review provides evidence for health care practitioners, patients, and health policy makers to make decisions concerning interventions following knee arthroplasty. The included studies are all randomised controlled trials in an important and homogenous patient group. In contrast to some systematic reviews that include a broad range of interventions, this review has included only those trials that examine active rehabilitation interventions that are clinically relevant: exercise programs based on functional activities. Furthermore, the review has considered clinically relevant and valid outcome measurements that are based on function, such as the Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index, the 6-Minute Walk Test and the SF-36.

However, one topic is omitted: data regarding compliance (adherence). Have any of the included randomised controlled trials included information regarding compliance? Compliance to rehabilitation programs is of great importance in determining their effectiveness. The duration in weeks or months of the physiotherapy programs are stated, but the amount of training each patient performed is not described in the included trials.

This systematic review provides evidence of short-term benefit from exercise programs based on functional activities after discharge after total knee arthroplasty. There was no evidence for a long-term benefit of the functional exercise programs. From both clinical and socioeconomic points of view, a short-term benefit is of great significance, although the cost effectiveness both for short- and long-term outcomes needs further study.

Further evidence of an intensive outpatient program immediately after hospital discharge may also strengthen the basis for a reduction in length of hospital stay. A new randomised controlled trial of the effectiveness of an intensive exercise program immediately after hospital has recently been published (Bulthuis 2007), and new studies examining the cost effectiveness of such programs should be done.

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References

A coach-controlled rehabilitation program reduces the risk of reinjury among amateur soccer players

Synopsis


Question: Among amateur soccer players with a recent injury, can a rehabilitation program that is implemented by coaches according to an algorithm with return-to-play criteria reduce the risk of reinjury? Design: Cluster-randomised controlled trial with blinded outcome assessment and intention-to-treat analysis. Setting: Sixth highest division of amateur male soccer competition in Sweden. Participants: Twenty-four teams (582 players) were randomised to use a rehabilitation program with injured players before returning them to match play, or to a control arm. Interventions: The rehabilitation program involved graded return to individual training, team training, and match play. Decisions about progression through the program were made by coaches with reference to an algorithm with criteria to determine when to recommence progressively more taxing training drills and match play. The criteria for progressing through the rehabilitation program related to pain and swelling in response to training and the severity of the injury. Outcomes: The primary outcome was the rate of reinjury throughout the season, with subsequent analyses of the risk of reinjury during the first week, the first month, the second month, and more than two months after the initial injury. Lower limb injuries were also analysed separately. Compliance with the rehabilitation program was recorded. Results: Two teams from each arm of the trial withdrew after randomisation. Ninety players (37%) in the intervention group incurred 132 injuries and 79 players (33%) in the control group incurred 134 injuries. Reinjury occurred in 11% of the injuries in the intervention group – significantly fewer than the 30% of the injuries that occurred in the control group. This indicates that for every 5 injuries managed with the rehabilitation program, a reinjury would be prevented (95% CI 4 to 10). For lower limb injuries, only 4 injuries would need to be managed with the program to prevent a reinjury (95% CI 3 to 7). The majority of the reinjuries occurred early after the initial injury, and 44% occurring within the first week, and 80% within the first month. Compliance with the program was 68% in the intervention group. All three reinjuries within the first week of returning to match play in the intervention group were cases where the coach did not comply with the program. Conclusion: A rehabilitation program implemented by coaches with return-to-play criteria reduces the reinjury rate in amateur soccer players.

Commentary

Soccer is one of the most popular sports throughout the world. It has a high injury rate, and most injuries occur to the lower limb (Powell & Barber-Foss 2000, Hägglund et al 2007). Although there is evidence that many injuries can be prevented (Abernethy & Bleakley 2007), there is little in the literature describing preventive measures for soccer reinjury. This trial of a program to prevent reinjury is therefore a welcome addition to the literature. The results are impressive, showing that injury recurrence in amateur soccer players was substantially reduced by using the program. Coaches and players should be made aware of the results and use the program.

The program is based on the hypothesis that many injuries recur because of premature return to play. Load is progressively increased on the injured limb with graded functional exercises such as turning, cutting, ball training, shooting, jumping, and sprinting manoeuvres in several directions and with increasing speed. An injured player is not eligible for match play until full participation in team training without pain and swelling at the injured site is possible. This is logical, given the greater risk of injury in soccer during match play than during training (Emery et al 2005).

From a clinical perspective, several interesting points emerge. The rehabilitation program requires only low-cost, simple facilities. Although a team physiotherapist could implement the program, coaches can follow the algorithm independently. Also, the trial enrolled male soccer players exclusively. Gender, age, and type of sport can all significantly affect the rate and type of injuries that occur (De Haven & Lintner 1986, Sallis et al 2001). Trials of the program in female players, younger players, and other sports would be preferable to extrapolation of the results to these populations. Finally, while the study provides useful evidence for coaches, therapists should remember that it does not provide evidence about the management of these injuries in clinical practice. Further research is required to identify the most effective exercise intervention for clearly defined subpopulations of patients with lower limb injuries.

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References

Manipulative therapy or NSAIDS do not provide additional benefit to quality baseline care for acute back pain


**Question:** Does the addition of non-steroidal anti-inflammatory drugs (NSAIDs) or spinal manipulative therapy (SMT), or both, result in faster recovery for patients with acute low back pain receiving recommended first-line care from a general practitioner?

**Design:** Randomised controlled trial with factorial randomisation into 4 treatment arms. The study used concealed allocation, blinding of participants (who assessed most outcomes), blinding of prescribers of one intervention, and intention-to-treat analysis.

**Setting:** Community-based study involving 40 general medical practitioners and 15 physiotherapists in private clinics in Sydney, Australia.

**Participants:** 240 patients with low back pain (with or without leg pain) of less than 6 weeks duration were included. Patients with suspected serious spinal pathology, nerve root compromise, or contraindications to SMT, NSAIDs or paracetamol were excluded.

**Interventions:** All participants were given baseline care as recommended in current clinical guidelines. This consisted of advice by the general practitioner (remain active, avoid bed rest, expect recovery) and the recommendation to take paracetamol (1g four times daily) until recovery, or a maximum of 4 weeks. Within 2 days of the GP visit, participants were randomly allocated to a one of 4 treatments: diclofenac (NSAID) 50 mg twice daily and placebo SMT; SMT and placebo drug; diclofenac 50 mg twice daily and SMT; or double placebo. The placebo NSAID was an inactive tablet with identical size, shape, and colour. The placebo SMT was detuned, pulsed ultrasound, providing matched treatment time and therapist contact. Participants were not informed whether their group allocation was active or placebo for either intervention.

**Outcomes:** The primary outcome was days to recovery from pain assessed by survival curves. Recovery from pain was defined in two ways: the first pain-free day and the first day of a seven-day, pain-free period.

**Results:** When recovery was defined as the first pain-free day, the rates of recovery for all participants in the trial were high: 99% of participants either recovered or were censored 12 weeks after randomisation. The addition of NSAIDs or SMT, or both, gave no additional clinically-worthwhile benefit to recovery rates (diclofenac hazard ratio 1.09, 95% CI 0.84 to 1.42; SMT hazard ratio 1.01, 95% CI 0.77 to 1.31). Similar results were obtained when the alternate definition of recovery was used.

**Conclusion:** This study provides robust evidence that recommended primary care of acute low back pain results in rapid recovery, with no further benefit provided by NSAIDs or SMT.

There are several issues to consider before drawing conclusions about clinical practice from the results of this trial. First, participants typically had a pain duration of approximately 1 week, so these results do not apply to patients with longer lasting pain. Second, the trial’s randomisation schedule determined which patients would receive manual therapy or not, rather than a clinician’s judgement deciding this. Perhaps only some ANSLBP patients respond favourably to manual therapy. However, there are currently no reliable methods to determine which patients will respond to particular treatments (Billis et al 2007). Third, only 5% of participants received high velocity SMT. Although there is no clear evidence that high velocity SMT is more effective than mobilisation (Assendelft et al 2004), proponents of the former will claim that this study did not test the effectiveness of this technique. Fourth, it would have been interesting to see a ‘GP only’ group. Perhaps there is something gained from being referred to a physiotherapist, even if the treatment itself is a placebo.

Finally, the question remains, if a patient with ANSLBP consults a GP, will guideline-recommended treatment be provided? The evidence suggests otherwise and best practice is not guaranteed (Buchbinder and Jolley 2007). In the Hancock RCT, GPs were given training to deliver best care. Perhaps patients in the ‘real world’ would not receive this quality care from their GP.

This trial does not bring the world crashing down for manual therapists as some press reports have stated, but the treatment these therapists provide does need to be considered carefully in light of the trial results.

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**References**


Breathing and relaxation training improves respiratory symptoms and quality of life in asthmatic adults

Synopsis


Question: Does breathing and relaxation training improve respiratory symptoms and quality of life in adults with asthma?

Design: Randomised controlled trial. Setting: Primary care (GP practice) in Hertfordshire, UK. Participants: Adults diagnosed with asthma and registered with the GP practice were recruited via a postal survey and invited to attend for a physiotherapy assessment of their asthma; 85 met the inclusion criteria (age 16–70 years, proficient in English, no serious co-morbidity) and agreed to participate in the trial. They were randomised to the intervention (n = 39) or control (n = 46) group. Interventions: Both groups received usual medical care. The intervention group received 5 × 60-minute sessions of individual treatment by the Papworth method. The method involves relaxation training, teaching of appropriate tidal and minute volumes for current metabolic activity, minimisation of inappropriate use of accessory muscles, diaphragmatic breathing, nasal breathing, and integration of these techniques into activities of daily living. Outcomes: Assessments were undertaken at baseline, post-treatment (6 months after baseline), and at 12 months. The primary outcome measure was the St. George’s Respiratory Questionnaire (SGRQ). Secondary outcome measures were the Hospital Anxiety and Depression Scale (HADS), the Nijmegen hyperventilation questionnaire, resting respiratory rate and end-tidal carbon dioxide level, and spirometry.

Results: Post-treatment and 12-month data were available for 78 and 72 patients respectively. Post treatment, the Symptoms subscale of the SGRQ was significantly better in the intervention group (by 11 points, 95% CI 2 to 20). This treatment effect was still present at 12 months (by 9 points, 95% CI 1 to 17). The other subscales of the SGRQ (Activities, Impacts) did not show a significant treatment effect, but the total SGRQ score was significantly better in the intervention group at 12 months, after adjustment for baseline values (p = 0.05). Nijmegen scores were significantly better in the intervention group at post-treatment (by 4 points, 95% CI 0 to 8), and at 12 months after adjustment for baseline values (p = 0.01). The only other significant differences in the remaining secondary outcomes were a reduction in relaxed breathing rate for the intervention group post treatment (by 5 breaths per minute, 95% CI 4 to 7), and at 12 months (by 6 breaths per minute, 95% CI 4 to 7). Conclusion: This study supports the hypothesis that the Papworth method ameliorates respiratory symptoms, reduces ventilation rate and improves quality of life in a general practice population of adults diagnosed with asthma.

[Effect sizes and 95% CIs calculated by the CAP Editor.]

Commentary

Clinical physiotherapists frequently provide breathing retraining for patients with hyperventilation symptoms (eg, asthma, hyperventilation syndrome). This study adds to the limited body of evidence that an intervention for patients with asthma involving breathing techniques has associated benefits. These can include improvements in quality of life, perceptions of improved symptom control, or reduced medication usage – although without any significant change in objective measures of lung function (Bowler 1998, Thomas et al 2003, Cooper et al 2003, Slader et al 2006). The ‘Papworth method’ may be unfamiliar to many, but the components of breathing control, relaxation, education, and nasal breathing will be recognisable as being common to other packages such as ‘Buteyko’ technique. The study has some methodological issues that limit the conclusions that can be drawn from the results. These include: the lack of a comparative ‘package’ to control for the individual attention received by participants in the intervention group; reliance on a documented diagnosis of asthma, with no confirmatory assessment; lack of data on medication usage during the trial; the ‘unblinded’ nature of the trial (ie, the researcher both provided the intervention and assessed outcomes). The limitations of this study are primarily a consequence of limited resources: the first author is a physiotherapist who designed, conducted, analysed, and disseminated the work herself. Well-designed, properly funded trials are needed urgently to confirm or reject the apparent benefits of this form of non-pharmacological therapy, to determine the mechanisms behind any benefits, and to assess its cost-effectiveness in the overall management of asthma.

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References