Acute low back usually resolves quickly but persistent low back pain often persists

Synopsis


Objective: To review the evidence of clinical course of pain and disability in patients with acute and persistent low-back pain, and to investigate whether pain and disability had similar courses. Data sources: MEDLINE, CINAHL and Embase databases were searched from 1950 to November, 2011. This search was supplemented by searching of reference lists from eligible studies. Study selection: Inception cohort studies involving patients with acute (< 6 weeks) and persistent (≥ 6 weeks) low-back pain in which pain or disability outcomes were reported. Data extraction: Two reviewers extracted data and discrepancies were resolved by consulting a third reviewer. Methodological quality was assessed using 5 criteria suggested by Altman (2001). A meta-analysis of pain and disability outcome data was conducted, in which pain and disability were modelled as a function of time. Data synthesis: Of 28 613 studies initially identified by the search, 43 studies (33 cohorts) with a total of 11 166 patients met the selection criteria. Data quality was insufficient in many of the studies; only 52% of the studies explicitly reported methods for assembling a representative sample, 73% had a follow-up of at least 80%, and 88% had a follow-up for at least one prognosis outcome at three months or longer. Based on the quantitative pooling of 24 cohorts and 4994 patients the variance-weighted mean pain score (0–100) was 52 (95% CI 48 to 57) at baseline, 23 (95% CI 21 to 25) at 6 weeks, 12 (95% CI 9 to 15) at 26 weeks, and 6 (95% CI 3 to 10) at 52 weeks after the onset of pain for cohorts with acute pain. Among cohorts with persistent pain, the variance-weighted mean pain score (out of 100) was 51 (95% CI 44 to 59) at baseline, 33 (95% CI 29 to 38) at 6 weeks, 26 (95% CI 20 to 33) at 26 weeks, and 23 (95% CI 16 to 30) at 52 weeks after the onset of pain. The course of disability outcomes was similar to the time course of pain outcomes in the acute pain cohorts, but for persistent pain cohorts disability only improved slowly, despite substantial initial improvement in pain. There were large within-study and between-study variation in outcomes. Conclusion: Most people who seek care for acute or persistent low-back pain improved markedly within the first six weeks, but afterwards improvement slowed. Low to moderate levels of pain and disability were still present at one year, especially in people with persistent pain.

Commentary

This review mainly concerns patients with non specific low-back pain, and not the patients with a confirmed disc herniation or nerve root involvement. It confirms two well-documented facts in the story of low-back pain: first, it clarifies that acute low-back pain patients in the great majority of cases recover within six weeks and have minor problems after one year. This is reassuring with regard to prognosis. Second, patients with persistent low-back pain also show substantial improvement in pain, but in contrast to the group with acute low-back pain, there are only small improvements in disability at one year of follow-up. These findings are in accordance with long-established views. Already in the 1980s it was emphasized that pain and disability are both conceptually and clinically different, and that failure to distinguish between pain and disability might explain some of the poor effectiveness of treatment interventions provided to patients with long-term back pain (Waddell 1987). The current meta-analysis is an important reminder of this distinction as suggested in a recent commentary (Buchbinder and Underwood 2012). A better distinction between pain and disability could improve our understanding of what contributes to persistent disability from an episode of low-back pain and identify better treatment targets.

Meta-analyses can be regarded with some skepticism, especially when information from very different studies is combined and the assessment of pain and disability was not standardised in the different studies. However, this review includes a large number of prospective cohorts and the tendency is clear. The large number of participants contributes to credible results. For society, the results of this study by Costa et al should be of great importance. They provide support for the policy that patients with acute low-back pain can be expected to recover quickly, consistent with European guidelines (van Tulder et al 2006). From a societal perspective there is a large need for improved preventive and treatment strategies for the group of patients with persistent low-back disability.

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References

Repetitive transcranial magnetic stimulation combined with treadmill training can modulate corticomotor inhibition and improve walking performance in people with Parkinson’s disease

Synopsis


**Question:** Does adding repetitive transcranial magnetic stimulation (rTMS) to treadmill training modulate cortical excitability and improve walking in people with Parkinson’s disease (PD)?

**Design:** Randomised controlled trial with blinded outcome assessment. **Setting:** A medical centre in Taiwan. **Participants:** Individuals with Parkinson’s disease (Hoehn and Yahr Stage 2–3), and ability to walk independently were key inclusion criteria. Absence of motor evoked potential in response to rTMS, history of seizure, and use of cardiac pacemaker were key exclusion criteria. Randomisation of 22 participants allocated 11 to each of the experimental and control groups. **Interventions:** Both groups underwent 12 treatment sessions over 4 weeks. In each session, the experimental group received rTMS (5 Hz) applied over the leg area of the motor cortex in the hemisphere contralateral to the more affected leg for 6 minutes, immediately followed by 30 minutes of treadmill training. The control group received sham rTMS in addition to the 12 sessions of treadmill training. **Outcome measures:** The primary outcomes were indicators of corticomotor excitability – motor threshold, silent period, short-latency and long-latency intracortical inhibition – measured in both cerebral hemispheres. The secondary outcomes were comfortable and fast walking speeds, and the timed-up-and-go test. The outcomes were measured at baseline and after the 4-week intervention period. **Results:** 20 participants completed the study. At the end of the 4-week intervention period, the increase in motor threshold of 3.5% and silent period of 14.0% of the contralateral hemisphere relative to the more affected leg was significantly more in the experimental group than the control group. Significantly more reduction of short-latency intracortical inhibition in the same hemisphere was also found in the experimental group relative to the control group 10.9%. The experimental group also had significantly more improvement than the control group in fast walking speed (by 10.1 cm/s) and in the timed-up-and-go test (by 2.0 s). No significant differences between the groups were reported in other outcomes. **Conclusion:** Repetitive transcranial magnetic stimulation can enhance the effects on corticomotor inhibition and improvement of walking function induced by treadmill training in patients with Parkinson’s disease.

Commentary

The application of non-invasive brain stimulation in rehabilitation has received considerable attention recently. Repetitive transcranial magnetic stimulation (rTMS) has been shown to enhance upper and lower extremity functions and/or modulate cortical excitability (Gonzalez-Garcia 2011, Khedr et al 2003, Lefaucheur et al 2004, Lomarev et al 2006). Yang et al (2013) are the first to combine rTMS and treadmill-walking training and reported electrophysiological and functional changes in patients with Parkinson’s disease (PD). They found that the experimental group had significantly more lengthening of the silent period, increase in resting motor threshold and gait speed than the sham group. These findings suggest that both functional improvement and possible cortico-motor plastic changes occur after combined rTMS and task-specific training. While the positive results from Yang et al (2013) and previous studies seem promising, the optimal dosage and stimulation protocol of rTMS are yet to be determined. Yang et al (2013) used high frequency rTMS of 5 Hz and stimulated the more affected side of the brain for 12 sessions. Previous studies employed high frequency rTMS stimulation ranging from 5 Hz to 25 Hz, and stimulated both hemispheres for a total of 8–15 sessions (Gonzalez-Garcia 2011, Khedr et al 2003, Lomarev et al 2006). Two studies reported that the improvement in gait performance lasted for 1 month (Khedr et al 2003, Lomarev et al 2006), hence the treatment effect beyond 1 month is not known. Although meta-analysis reported a positive trend of high frequency rTMS on reducing PD-specific impairment and disability level (Elahi et al 2009), most of the studies had a small sample size (n = 10–36). It is time to carry out large scale randomised controlled trials to determine the stimulation frequency, stimulation site and total pulse, and the number of treatment sessions. Further study is also needed to examine the long-term effect of rTMS in enhancing motor function and electro-physiological changes in PD.

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**References**

Telehealth reduces hospital admission rates in patients with COPD

Synopsis


Question: Does telehealth reduce the hospital admission rate and cost for people with chronic obstructive pulmonary disease (COPD)? Design: Randomised controlled trial with concealed allocation. Setting: The participants’ homes in Aalborg, Denmark. Participants were linked with healthcare professionals at primary and secondary healthcare facilities using telehealth technology. Participants: Adults were included if they had severe or very severe COPD, lived in Aalborg, and were free from other diseases that limited function (eg, heart disease). Randomisation allocated 60 to the intervention group and 51 to the control group. Interventions: Participants in the intervention group had a telehealth monitoring device installed in their home for four months and were taught how to monitor their symptoms, measure clinical data (eg, spirometry), use a step counter, and given instructions about home exercise. Healthcare professionals accessed the data to monitor their disease and provide advice. Once a month, the telehealth team met via video to co-ordinate and discuss each participant’s rehabilitation program. Those in the control group were instructed regarding home exercises but had no planned contact with healthcare professionals. Outcome measures: Hospital admission rate and cost of hospitalisation over a 10-month period. Results: A total of 105 participants completed the study. Over the follow-up period, the admission rate per patient was lower in the intervention group compared with the control group (0.49 vs 1.17, p = 0.041). The cost of hospitalisations appeared to be lower in the intervention group. Conclusion: Telehealth strategies that promote rehabilitation and early detection of an acute exacerbation reduced hospital admission rates in people with severe and very severe COPD.

Commentary

There is considerable interest in the role of telehealth for people with COPD. A systematic review has shown that telemonitoring of physiology and symptoms reduces emergency department visits and hospitalisations (McLean et al 2011). However the use of telehealth strategies to deliver home-based exercise training is in its infancy, despite the central role of pulmonary rehabilitation in COPD care.

In the study by Dinesen and colleagues, participants who received telerehabilitation had a lower rate of hospital admission than those who received usual care. Participants had severe to very severe COPD, which reflects the group most commonly seen in pulmonary rehabilitation. However, telerehabilitation did not include supervised exercise training, and the number of contacts with clinicians during the intervention period was not reported. Participants also engaged in ‘preventive self-monitoring using a telehealth monitor’. Therefore it is difficult to assess the effect the exercise program had on reducing hospitalisations, over and above the gains expected following self-management training on this outcome (Effing et al 2007).

This trial suggests that exercise participation can be encouraged using telemonitoring. However it remains uncertain whether telerehabilitation is as effective as best practice COPD care. Whilst it was stated that the usual care group in this study underwent the standard regimen for rehabilitation, this consisted of once-off instruction in home exercises, which does not meet the current definition of pulmonary rehabilitation (Nici et al 2006). This trial therefore does not allow us to compare the outcomes of telerehabilitation to those of standard, highly effective, pulmonary rehabilitation programs (Lacasse et al 2006). Until such comparisons are undertaken in robust trials, telerehabilitation remains a useful second-line treatment for those with COPD who, for reasons of geography or disability, cannot undertake supervised pulmonary rehabilitation programs.

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References

A physiotherapy telephone assessment and advice service for patients with musculoskeletal problems can improve the process of care while maintaining clinical effectiveness

Synopsis


Question: Does a physiotherapy telephone assessment and advice service (PhysioDirect) affect physical health and improve the process of care in patients with musculoskeletal problems? Design: Randomised controlled trial with concealed allocation and blinded outcome assessment.

Setting: Four community physiotherapy services drawing patients from 94 general practices in England. Participants: Adults referred by a general practitioner or self-referred to physiotherapy for a musculoskeletal problem were eligible for inclusion. Referral from a consultant and an inability to communicate in English were key exclusion criteria. Randomisation of 2256 participants at a ratio of 2:1 allocated 1513 to PhysioDirect and 743 to the usual care physiotherapy.

Interventions: PhysioDirect participants were invited to telephone a physiotherapist for initial assessment and advice followed by further telephone advice and face-to-face physiotherapy if necessary. After the initial call most participants were sent written advice about self management and exercises. The usual-care comparison group joined a waiting list for face-to-face physiotherapy management. Outcome measures: The primary outcome was change in physical health, measured with the physical component summary (PCS) measure from the SF-36 questionnaire at 6 weeks and 6 months. Secondary clinical outcome measures included the Measure Yourself Medical Outcomes Profile, global improvement in the main problem, and questions about satisfaction from the General Practice Assessment Questionnaire; and measures of process of care, including number of appointments, and waiting time.

Results: Primary outcome data were obtained from 85% of participants at 6 months. There was no difference in the SF-36 PCS measure between the PhysioDirect and comparison groups at 6 months (Mean difference (MD) = –0.01, 95% CI –0.80 to 0.79) and 6 weeks (MD 0.42, 95% CI –0.28 to 1.12). There were no differences between the groups in other clinical outcomes at 6 months, but there were small improvements in the PhysioDirect group at 6 weeks in the global improvement score (MD 0.15 units, 95% CI 0.02 to 0.28) and in the Measure Yourself Medical Outcomes Profile score (MD –0.19 units, 95% CI –0.30 to –0.07). 47% of PhysioDirect participants were managed entirely by telephone, and they had fewer face-to-face appointments (mean 1.9 vs 3.1), and a shorter wait for physiotherapy treatment (median 7 vs 34 days) than the comparison group. PhysioDirect participants were less satisfied with the service than the comparison group (MD –3.8%, 95% CI –7.3 to –0.3). Conclusion: Providing an initial telephone physiotherapy service for patients with musculoskeletal problems that reduced waiting time and required fewer appointments was as effective as providing face-to-face physiotherapy, but was associated with slightly lower patient satisfaction.

Commentary

Ever-increasing waiting lists are a problem for our health system. Triage that involves patient management has been identified as an effective way to improve patient flow in emergency departments, and it is possible that the same principles may have similar effects in other aspects of healthcare (Harding et al 2011). Salisbury et al describe a telephone-based approach to triage and advice for physiotherapy in the UK and found no adverse effects on outcomes for people with musculoskeletal disorders. The PhysioDirect intervention examined by Salisbury et al did not aim to substitute for a standard physiotherapy examination of the patient. Rather, the telephone-based approach aimed to identify those who did not require face-to-face appointments and could be effectively managed with advice and reassurance alone. The effect of early and appropriate advice is acknowledged in the treatment of acute back pain (van Tulder et al 2006) and the physiotherapists were taught enhanced communication skills to ensure a comprehensive telephone-based assessment. Almost all (98%) of the participants in the trial were referred by a GP, meaning there had been a prior opportunity for some level of physical examination before telephone-based physiotherapy. It is difficult to imagine effective physiotherapy without some form of physical examination, but the removal of this aspect of a consultation may enhance the impact of the advice and reassurance a physiotherapist can provide. On the other hand, the difference between patient expectations of physiotherapy and what can be delivered via the telephone may be a reason behind lower levels of satisfaction with the PhysioDirect approach. Innovative approaches are needed to deal with the challenges presented to our burgeoning health system. The proliferation of mobile phones mean flexible and time-efficient tele-interventions, such as health coaching (Iles et al 2011) and triage and advice as examined by Salisbury et al hold great promise for reducing the burden on our health care system.

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References