Extracorporeal shock wave therapy no better than placebo in the treatment of plantar fasciitis

Synopsis


**Question:** Does ultrasound-guided extracorporeal shock wave therapy (ESWT) improve, pain function or quality of life in patients with plantar fasciitis? **Design:** Randomised placebo-controlled trial. **Setting:** Melbourne (Australia) radiology clinic. **Patients:** Of 178 patients referred to the clinic, 169 were eligible for inclusion and 166 consented and were randomised. Criteria for inclusion included: older than 18 years, presence of plantar heel pain for at least six weeks and ultrasound confirmed lesion. Exclusion criteria included: inflammatory arthritis, previous surgery to heel and previous ESWT to any site. **Interventions:** Eighty-one patients were allocated to the active ESWT group and 85 to placebo ESWT. Both groups received 3-weekly treatments. In the ESWT group, patients received either 2000 or 2500 shock waves per treatment of energy levels varying between 0.02 mJ/mm² and 0.33 mJ/mm², pulse frequency gradually increased to 240 per minute, a minimum total dose of 1000 mJ/mm² being the treatment goal. In the placebo group, treatment consisted of 100 shock waves per treatment, energy level of 0.02 mJ/mm², frequency 60 per minute, total dose 6.0 mJ/mm². **Outcomes:** Overall, morning and activity pain were measured with 100 mm visual analogue scales, reported walking tolerance was measured on a 6-point ordinal scale, disability was measured with the Maryland Foot Score (range 0-100) and a patient-specific measure (the Problem Elicitation Technique), quality of life was measured with the SF-36 (eight sub-scales each scored 0-100). Outcomes were assessed at six and 12 weeks by a blinded assessor and analysed according to the intention-to-treat principle. **Result:** There were no clinically significant differences between groups at baseline. In general, there were no statistically significant between-group differences for any outcome (two sub-scales of the SF-36 were marginally significant at six weeks, $p = 0.03$ and 0.05, and favoured placebo). For example, at 12 weeks the between-group difference (95% CI) for change in overall pain was 0.6 (-10.3; 11.5), morning pain 0.2 (-12.7; 13.1), Maryland Foot Score 1.2 (-7.6; 5.3), SF-36 Physical Function score -2.3 (-9.9; 5.3). **Conclusion:** In patients with plantar fasciitis, ESWT is not effective in improving pain, function or quality of life.

Commentary

A Cochrane review and three systematic reviews have provided conflicting conclusions on the efficacy of ESWT. Heller and Niethard’s (1998) meta-analysis of 24 RCTs (1585 patients) concluded that ESWT was of clinical benefit. Bodekker et al (2001) reviewed 21 RCTs specific to plantar fasciopathy and determined that none of the trials satisfied all their criteria and that further RCTs were needed. Crawford et al (2002) concluded that limited evidence existed supporting the effectiveness of low energy ESWT. Ogden et al (2002), in a meta-analysis of eight RCTs (840 patients), concluded that ESWT directed at the enthesis of the plantar fascia on the inferior calcaneus is a “safe and effective non-surgical method of treating chronic, recalcitrant heel pain syndrome that has been refractory to other commonly used non-operative procedures.”

There are a number of possible reasons for the Buchbinder et al result. Firstly this study included subjects with a relatively short symptom duration (from eight weeks with median duration 36 weeks) whereas previous studies have not included subjects of less than 24 weeks duration, which may be prior to the processes of the inflammatory response having stabilised and prior to maturation of scarring within the fascia. Secondly, the authors describe the ESWT focus targeting criteria as being within the thickest area of the plantar fascia. This may differ from results obtained in studies that have targeted, under imaging guidance, the symptomatic region at the enthesis and obtained a treatment effect.

This study does not support the use of ESWT in subjects who have a symptom pattern of less than 24 weeks.

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References

Work and non-work-related stress increase the risk of arm symptoms

Synopsis

Summary of Bongers PM, Kremer AM and Ter Laak J (2002): Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow, or hand/wrist? A review of the epidemiological literature. American Journal of Industrial Medicine. 41: 315-42. [Prepared by Bart Staal, Department of Epidemiology, Maastricht University, Netherlands.]

Question: Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow, or hand/wrist?

Design: Systematic review of epidemiological studies (cross-sectional, case-control and prospective cohort studies) on psychosocial risk factors for upper extremity problems. Setting: Occupational setting. Subjects: The participants in the reviewed studies consisted of workers with symptoms of upper extremity problems and workers at risk of developing upper extremity problems.

Risk factors: The methodological quality of the included studies was assessed. Levels of evidence prioritised to assess the strength of the evidence for the following psychosocial risk factors: high quantitative job demands, high qualitative job demands, low stimulus from work, low job control, low social support, low job satisfaction, high perceived job stress, few rest break opportunities, support (non-work), and worry/distress/stress reactions not work-related.

Outcome measures: Signs and symptoms of upper extremity problems assessed by questionnaire, (telephone) interview, physical examination and/or medical records.

Main results: Among the 28 studies included, only one was a prospective cohort study and one a case-control study. The other 26 studies were based on cross-sectional analyses. High perceived job stress was consistently associated with all upper extremity problems in high and lower quality studies. This association was also found in the prospective cohort study. The risk ratios were modest and varied from 1.2 to 2.5. Non-work-related stress was also consistently associated with upper extremity problems, although this was not often investigated. Further, there was evidence for a relationship between high job demands and upper extremity problems. However, this result did not meet the pre-set criterion for consistency (ie more than 75% of the studies report an association). Conclusion: High perceived job stress and non-work-related stress were consistently associated with upper extremity problems. Most studies included a cross-sectional study design, which makes it impossible to draw firm conclusions regarding the role of psychosocial risk factors in the aetiology of upper extremity problems.

Commentary

This paper is a systematic review on an important topic. On the one hand, upper extremity problems are very prevalent in Western society. On the other hand, several ongoing surveys indicate that workers consider themselves increasingly exposed to psychosocial risk factors, which may be due to work itself, to the work/home interface or to non-work factors. Although it is often regarded as obvious that psychosocial factors are associated with upper extremity problems, the evidence on specific relationships is still lacking.

The reviewers rated 10 of the included studies good, 12 moderate and six poor. This is rather surprising, as 26 of the 28 studies were cross-sectional. This leads me to two drawbacks of the review. Firstly, assessment of strength of evidence was hampered, ie “strong evidence” could not be concluded at all. Secondly, the conclusions of the review should have been formulated even more cautiously than the reviewers did, because in many studies, the psychosocial factor(s) and upper extremity problem(s) were assessed in the same questionnaire or interview. Self-reports on exposure and outcome at the same time may lead to differential misclassification, eg workers suffering from upper extremity problems might experience their job demands as higher than their colleagues without upper extremity problems. This results in an over-estimation of the risk ratios, which were generally modest as it was (ranging between 1.2 and 2.5).

The finding that stress, whether it results from work or not, is associated with upper extremity problems is relevant for clinicians. The reviewers rightly indicate that psychosocial factors might be related to upper extremity problems through many patho-physiological pathways, several of which can be well intervened by physiotherapists. For instance, simple feedback as to muscle tension or muscle co-activation might be beneficial. The same goes for training in the use of relaxation techniques. However, these clinical implications do not alter the need for further high quality research on the role of psychosocial factors in the (re)occurrence of upper extremity problems.

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Synopsis


**Question:** What are the effects of stretching before and after exercising on muscle soreness after exercise, risk of injury, and athletic performance?

**Design:** A systematic review of randomised or quasi-randomised controlled trials.

**Setting/population:** Young, healthy volunteers, mainly students and army recruits.

**Interventions:** Any stretching technique, before or after exercising. Exercise included step-tests, eccentric contractions or physical workout.

**Outcomes:** Muscle soreness, incidence of injury, athletic performance.

**Result:** Eight trials were included in the review. Six studies investigated delayed onset muscle soreness and two investigated injury risk. No studies were found investigating the effect of stretching on athletic performance. The methodological quality of the studies was generally moderate. The mean quality score was 4.1 out of 10 on the PEDro scale. Five of the included studies that evaluated onset of muscle soreness were included in a meta-analysis. Three studies evaluated stretching after exercise and two evaluated stretching before. The total stretch time varied from 300 seconds to 600 seconds, but in one study, total stretch time was only 80 seconds. Stretching produced small and statistically non-significant reduction in muscle soreness at 24, 48 and 72 hours. The pooled effect estimate of reduction in muscle soreness 24 hours after exercising was 0.9 mm on a 100 mm scale (95% CI -2.6 mm to 4.4 mm). Two studies that evaluated the effects of stretching before exercising on the risk of injury in military recruits showed no difference in the risk of injury between groups.

**Conclusion:** Stretching before or after exercise has no effect on delayed muscle soreness. Stretching before exercise does not produce reduction in risk of injury in army recruits.

Commentary

Promoting stretching seems to be based primarily on anecdotal evidence, indicated by studies examining the effect of stretching on the muscle-tendon unit (Magnusson 1998, Halbertsma et al 1999) and the present review. It is, nevertheless, important to consider the reason for applying stretching, type of stretching technique and the target population. These three issues are important since different objectives may require different application techniques. Herbert et al's study is a very high quality systematic review that considered the above-mentioned issues within the review. While two of the objectives were relatively unambiguous (could stretching reduce delayed soreness or minimise the amount of injury) the third objective, could stretching improve athletic performance, was a lot more diffuse. This may be the reason why no articles considering this question were found.

The finding that stretching does not decrease delayed onset muscle soreness seems very reliable, since the authors had performed a thorough review of high quality. The conclusion is further supported by an experimental study, where stretching showed no effect on delayed onset muscle soreness, and in addition even led to a significant decrease in muscle strength (Lund et al 1998). Pope's two studies (Pope et al 1998 and 2000) seem to be a very convincing documentation of the authors’ conclusion that stretching may not have any effect on the number of injuries. However, experimental data suggest that repetitive stretching will lead to a reduction of load on the muscle-tendon unit at a given length, thus decreasing the risk of strain injuries, since the load is minimised (Garrett 1990).

Nevertheless, the result that matters is the results from clinical settings even though experimental studies indicate otherwise.

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References


Traditional Chinese acupuncture does not improve outcomes from post-stroke motor rehabilitation

Synopsis


Question: Does acupuncture improve outcomes in patients after acute stroke? Design: Randomised controlled trial. Setting: Hong Kong stroke rehabilitation unit. Patients: One hundred and six Chinese patients, enrolled 3-15 days after acute stroke, stratified first into moderate or severe impairment groups, then randomised into two treatment groups (overall 13% dropout rate).

Interventions: Treatment was for 10 weeks for all subjects. Control group (N = 62) received only traditional care (inpatients for five weeks, then rehabilitation day hospital for five weeks). The intervention group (N = 44) also had traditional care plus an average of 35 sessions of acupuncture lasting 30 minutes per session. Traditional Chinese acupuncture was provided in a standardised manner to 10 well described acupoints by the one experienced practitioner, five times per week for three weeks as inpatients, then as day hospital patients (three times per week for five weeks, then twice per week for the final two weeks). Traditional care included physiotherapy (5 sessions per week of 60 minutes each session of Bobath-based treatment), occupational therapy (five sessions per week of 45 mins each session), speech therapy and psychology as indicated, daily medical assessment and nursing. Drug therapy (antiplatelet and anticoagulants) was prescribed as required. Outcomes: Primary outcome: Fugl-Meyer Motor Assessment (motor recovery). Secondary outcomes: Barthel Index (functional disability), FIM (functional, communication, cognitive disability), AMT (Abbreviated Mental Test (cognitive impairment)), NIH Stroke Scale (neurological impairment), all scored at 0, 5 and 10 weeks by blinded assessors. Results: No significant differences were found for any outcome measure, comparing control and intervention groups at any stage in the study. For example, for subjects who were moderately impaired at baseline, by 10 week follow-up the median improvement in the intervention group was 18.8 points (interquartile range (IQR) 6.2-26.9) on the 100-point Fugl-Meyer Motor Assessment scale and in the control group was 14.5 points (IQR 4.0-26.4) (Mann Whitney U test \(p = 0.280\)). For the severe stroke sub-group, the intervention group improved by a median of 9.8 points (IQR 4.2–19.8) and the control group by 12.7 points (IQR 8.6–26.3) (Mann Whitney U test \(p = 0.200\)). Conclusion: The addition of a standardised traditional Chinese acupuncture treatment does not enhance the outcomes of traditional management of acute stroke.

Commentary

Clinicians working in post-stroke rehabilitation settings are frequently asked by clients and families about the efficacy of various complementary therapies, in order to enhance outcomes from stroke. This is understandable given the potentially devastating and long term nature of the impairments and restrictions on activities in all aspects of daily life that can result from stroke, affecting not just individuals but also their families and friends.

This article provides valuable information about the effectiveness of traditional Chinese acupuncture in the management of the acute post-stroke phase. The authors have conducted a rigorous randomised controlled trial using as a control, standard multidisciplinary post-acute stroke rehabilitation, and added standardised traditional Chinese acupuncture as an adjunct to this management. They have described the subjects, and the treatment provided to control and intervention subjects sufficiently rigorously to allow replication of the study in other settings.

They also used a range of usual stroke outcome measures to estimate the effectiveness of treatment in aspects of impairments and disability, and recovery of motor control. They concluded that traditional Chinese acupuncture offers no additional benefit in terms of motor outcomes, or changes in cognition and disability, compared with standard therapy alone. Given the rigour of the study, and the range of outcome measures used, there seems little doubt that this form of treatment is not effective in this setting. Such studies are important to enable clinicians and consumers to be informed in their choice of alternative modalities.

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