

Central hyperexcitability as measured with nociceptive flexor reflex threshold in chronic musculoskeletal pain: A systematic review

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- Pain, 04/29/2011

Abstract

Chronic musculoskeletal conditions are increasingly conceived as involving altered central nervous system processing, and impaired nociceptive flexor reflex (NFR) appears to reflect altered central nervous system processing. The primary objective was to synthesize the evidence for impaired NFR in these conditions. The secondary objective was to evaluate the NFR stimuli parameters employed by reviewed studies. Electronic databases: MEDLINE, CINAHL, Embase, PEDro, Google Scholar, and Cochrane library were searched from the mid-1960s to June 2010. Experimental reports were systematically reviewed and meta-analysis (where possible) was performed. NFR thresholds and parameters of NFR stimuli were extracted. Sixteen trials were identified, 11 of which were suitable for inclusion in the meta-analysis. Compared to healthy controls, standardized mean differences in NFR threshold were significantly lower in subjects with primary headache (-0.45 ; 95% confidence interval [CI] -0.77 to -0.13 , $P = 0.005$), fibromyalgia (-0.63 ; 95% CI -0.93 to -0.34 , $P < 0.0001$), knee pain (-1.51 ; 95% CI -2.10 to -0.93 , $P < 0.00001$) and whiplash (-0.73 ; 95% CI -1.11 to -0.35 , $P = 0.0002$). Employed stimuli parameters vary between studies, with inter-pulse duration ($P = 0.044$) being identified by multiple regression analysis as independent predictors of the variability in NFR threshold in healthy controls. The results indicate that there is evidence of central hyperexcitability in people with chronic musculoskeletal pain. Our review also suggests that shorter inter-pulse duration tends to yield smaller variability in NFR threshold. However, further research investigating optimal stimulation parameters is still warranted.

Reduction of postoperative stiffness after arthroscopic rotator cuff repair: results of a customized physical therapy regimen based on risk factors for stiffness. [Koo SS](#), [Parsley BK](#), [Burkhart SS](#), [Schoolfield JD](#)

201102 27(2):155-60 Language: eng Country: United States Orthopedics International, Seattle, Washington, U.S.A.

PURPOSE: The purpose of this study was to determine the benefits of a modified rehabilitation protocol (incorporating early closed-chain overhead stretching) in reducing the risk of postoperative stiffness after arthroscopic rotator cuff repair.

METHODS: During a 17-month period, we performed primary arthroscopic rotator cuff repairs in 152 patients. After surgery, patients with risk factors identified in the previous study (calcific tendonitis, adhesive capsulitis, PASTA [partial articular surface tendon avulsion]-type rotator cuff repair, concomitant labral repair, or single-tendon cuff repair) were enrolled in a modified rehabilitation protocol that added early overhead closed-chain passive motion exercises to our standard protocol; alternatively, patients without risk factors received a standard conservative rehabilitation program. Historical controls were used and comprised patients in the senior author's practice who all received the conservative rehabilitation protocol. The prevalence of postoperative stiffness was compared between the historical cohort and current study patients by use of Fisher exact tests.

RESULTS: Among the 152 patients studied, 79 were positive for at least 1 of the specified risk factors and received the modified protocol. Postoperative stiffness developed in none of the 79 patients enrolled in the modified program. This finding represented a significant improvement (Fisher exact test, $P = .004$) over the historical controls, in which 18 of the 231 at-risk patients had significant postoperative stiffness develop.

CONCLUSIONS: In at-risk patients (with calcific tendonitis, adhesive capsulitis, PASTA repair, concomitant labral repair, and single-tendon repair), a postoperative rehabilitation regimen that incorporates early closed-chain passive overhead motion can reduce the incidence of postoperative stiffness after arthroscopic rotator cuff repair.

LEVEL OF EVIDENCE: Level IV, therapeutic case series.

PMID: 20970299

Lumbar Facet Joint Motion in Patients with Degenerative Disc Disease at Affected and Adjacent Levels: An In Vivo Biomechanical Study Spine May 2011; Volume 36 - Issue 10 - p E629–E637

Objective: To evaluate the effect of lumbar degenerative disc diseases (DDD) on motion of the facet joints during functional weight-bearing activities.

It has been suggested that DDD adversely affects the biomechanical behavior of the facet joints. Altered facet joint motion, in turn, has been thought to associate with various types of lumbar spine pathology including facet degeneration, neural impingement, and DDD progression. However, to date, no data have been reported on the motion patterns of the lumbar facet joint in DDD patients.

Methods: Ten symptomatic patients of DDD at L4–S1 were studied. Each participant underwent magnetic resonance images to obtain three-dimensional models of the lumbar vertebrae (L2–S1) and dual fluoroscopic imaging during three characteristic trunk motions: left-right torsion, left-right bending, and flexion-extension. *In vivo* positions of the vertebrae were reproduced by matching the three-dimensional models of the vertebrae to their outlines on the fluoroscopic images. The kinematics of the facet joints and the ranges of motion (ROMs) were compared with a group of healthy participants reported in a previous study.

Results: In facet joints of the DDD patients, there was no predominant axis of rotation and no difference in ROMs was found between the different levels. During left-right torsion, the ROMs were similar between the DDD patients and the healthy participants. During left-right bending, the rotation around mediolateral axis at L4–L5, in the DDD patients, was significantly larger than that of the healthy participants. During flexion-extension, the rotations around anteroposterior axis at L4–L5 and around craniocaudal axis at the adjacent level (L3–L4), in the DDD patients, were also significantly larger, whereas the rotation around mediolateral axis at both L2–L3 and L3–L4 levels in the DDD patients were significantly smaller than those of the healthy participants.

Conclusion: DDD alters the ROMs of the facet joints. The rotations can increase significantly not only at the DDD levels but also at their adjacent levels when compared to those of the healthy participants. The increase in rotations did not occur around the primary rotation axis of the torso motion but around the coupled axes. This hypermobility in coupled rotations might imply a biomechanical mechanism related to DDD.

Association Between Intensity of Pain and Impairment in Onset and Activation of the Deep Cervical Flexors in Patients With Persistent Neck Pain Clinical Journal of Pain; May 2011 - Volume 27 - Issue 4 - p 309–314

Objectives: This study evaluates the relationship between clinical symptoms and the function of the deep cervical flexor muscles in women with persistent neck pain.

Methods: Thirty-two women with a history of neck pain more than 6 months participated in the study. Measures for neck pain area, intensity, duration, and perceived disability were taken. Electromyography was acquired from the deep cervical flexor muscles by a nasopharyngeal electrode suctioned over the posterior oropharyngeal wall as the patients performed 2 tasks: rapid arm movements (shoulder flexion and extension) and isometric craniocervical flexion contractions.

Results: The patients' average score for the Neck Disability Index (0 to 50) was 11.0 ± 2.6 and their average pain intensity rated on a visual analog scale (0 to 10) was 4.7 ± 1.8 . A correlation was observed between the average intensity of pain rated on the visual analog scale and the normalized electromyography amplitude recorded from the deep cervical flexors during the craniocervical flexion contractions. Furthermore, the relative onset of the deep cervical flexors during rapid shoulder flexion was positively correlated with the average intensity of pain. No significant correlations were identified between the amplitude and the onset of activation of the deep cervical flexors and the duration of pain, area of pain, or Neck Disability Index score of the patient.

Discussion: This study shows a relationship between the levels of neck pain intensity and the function of the deep cervical flexor muscles in women with persistent neck pain but not in other clinical features, such as location or duration of the disorder. These findings may partially explain the heterogeneity in motor control impairments in patients with neck pain.

Current evidence for effectiveness of interventions to treat rotator cuff tears

Manual Therapy; Volume 16 (3); Pages 217-230 June 2011

In this systematic review we assessed effectiveness of non-surgical and (post)surgical interventions for symptomatic rotator cuff tears (RotCuffTear). The Cochrane Library, PubMed, Embase, Cinahl, and Pedro were searched for relevant systematic reviews and randomized controlled trials (RCTs). Two reviewers independently selected relevant studies, extracted data and assessed the methodological quality.

Three Cochrane reviews (7 RCTs) and 14 RCTs were included (3 non-surgery, 10 surgery, 8 post-surgery). For small or medium RotCufftears, moderate evidence was found in favor of surgery versus physiotherapy in mid- and long-term. In surgery, tendon-to-bone fixation with one metal suture anchor loaded with double sutures (TB) was more effective (moderate evidence) than a side-to-side repair with permanent sutures (SS) in the mid- and long-term; limited evidence for effectiveness was found in favor of debridement versus anchor replacement and suture repair of the type II SLAP tear in the long-term. Further, no evidence was found in favor of any non-surgical, surgical or post-surgical intervention.

In conclusion, although surgery seems to give better results compared to non-surgery and TB is more effective than SS in rotator cuff repair (RCR), it remains hard to draw firm evidence-based conclusions for effectiveness of non-surgical or (post)surgical interventions to treat RotCuffTears. More research is clearly needed.

Outcomes Following Non-operative and Operative Treatment for Cervical Disc Herniations in National Football League Athletes

Spine; May 2011 - Volume 36 - Issue 10 - p 800–805

Objective: To determine the performance-based outcomes in elite athletes of the National Football League (NFL) after a cervical disc herniation. Because outcomes after the treatment of cervical disc herniations (CDH) in elite athletes are currently unknown, the treatment decisions for this injury in professional football players are often controversial.

Methods: NFL players diagnosed with a CDH were identified through previously published protocols using team injury reports and newspaper archives. The “Performance Score” for each player was calculated on the basis of pertinent statistical data, before and after diagnosis of CDH. Data analysis was performed for players with at least a 2-year follow-up.

Results: A total of 99 NFL athletes met the inclusion criteria. In the operative group, on average, 38 of 53 (72%) players successfully returned to play for 29 games over a 2.8-year period, which was significantly greater than that of the non-operative group, in which only 21 of 46 (46%) players successfully returned to the field to play after treatment for 15 games over a 1.5-year period. Performance scores and the percentage of games started were not statistically significantly different for either cohort, before and after treatment. Notably, defensive backs had a significantly poorer outcome after treatment for CDH than any other position, playing in only 10 games over a 1.2-year period compared with all others. Age at diagnosis demonstrated a negative effect on career longevity after treatment.

Conclusion: The data in this study suggest that players have higher return-to-play rates and longer careers after operative treatment than players treated with non-operative means. Although confounding variables such as concomitant cervical stenosis could have affected these data, these performance-based outcomes after surgical treatment for CDH are better than previously thought. Defensive backs have a poorer prognosis after CDH compared with players of all other positions.

Neck/shoulder pain is more strongly related to depressed mood in adolescent girls than in boys Manual therapy; Volume 16 93); Pages 246-251; June 2011

A cross-sectional study of 1258, 14 year old girls and boys used self-report and physical examination measures to assess neck/shoulder pain in the last month, depressed mood, physical fitness, body composition, self-efficacy, global self-worth, family functioning and social advantage. The data was used to compare the relationship between de-pressed mood and neck/shoulder pain (NSP) in adolescent girls and boys.

The prevalence of NSP in girls (34%, 211/621) was significantly greater than in boys (21%, 134/637). After controlling for covariates, girls with medium (OR = 4.28; CI = 2.31–7.92) and high depressed mood (OR = 8.63; CI = 4.39–16.98) were significantly more likely to report NSP than girls with low de-pressed mood. Depressed mood was also a significant correlate of NSP in boys after controlling for covariates, although the association was substantially weaker (OR = 2.44; CI = 1.29–4.61).

After controlling for relevant biological, psychological and social covariates, depressed mood was a significant correlate of NSP in both sexes; but the association between depressed mood and NSP was significantly stronger for girls than for boys.

Improving Schoolchildren's Knowledge of Methods for the Prevention and Management of Low Back Pain: A Cluster Randomized Controlled Trial Spine; 15 April 2011 - Volume 36
- Issue 8 - p E505–E512

Objective: To evaluate the effect of a very simple education campaign among community-dwelling 8-year-old schoolchildren.

Information has a positive effect on low back pain (LBP) prevention and management. There is sparse evidence on the feasibility and effectiveness of education campaigns focusing on LBP among young schoolchildren.

Methods: A stratified random sample of 12 schools was randomized to an intervention and a control group. Eight-year-old schoolchildren from these schools were given a questionnaire on LBP prevention and management at baseline, and 15 and 98 days later. On day 8, teachers in the intervention group gave the schoolchildren a *Comic Book of the Back*, while no intervention was carried out in the control group. After adjusting by possible confounders, generalized estimating equations (GEE) models were developed to calculate the probability of “success” (a score over 80% of the maximum possible one).

Results: Six schools (231 children, 46.5%) were assigned to the control group, and 6 (266 children, 53.5%) to the intervention one. At baseline, the percentage of correct answers was above 73% in both groups, with 8 as a median total score in the control group and 7 in the intervention group. GEE showed that the odds ratio for success in the intervention group, when compared with the control group, was 1.61.

Conclusion: The handing out of a *Comic Book of the Back* slightly improves children's knowledge of appropriate methods for the prevention and management of LBP, and the effect remains significant 3 months after intervention.

Upper limb neurodynamic test 1 and symptoms reproduction in carpal tunnel syndrome. A validity study Manual Therapy; Volume 16 (3); Pages 258-263; June 2011

The aim of this study was to estimate the validity of the Upper Limb Neurodynamic Test 1 (ULNT1) for the diagnosis of Carpal Tunnel Syndrome (CTS) with blind comparison to a reference criterion of a compatible clinical presentation and abnormal nerve conduction. 47 subjects with suspected CTS were enrolled. All patients were tested with nerve conduction studies and ULNT1. Considering results as positive in the presence of reproduction of symptoms on affected upper limb, or side-to-side differences in elbow extension, or symptoms modified by lateral neck side-bending, we estimated sensitivity as 91.67%, specificity as 15%, positive likelihood ratio as 1.0784, negative likelihood ratio as 0.5556, and post-test probability for negative test as 40%. Using a new criterion, i.e. the reproduction of symptoms only in the first three digits of the affected hand, we estimated sensitivity as 54.17%, specificity as 70%, positive and negative likelihood ratios as 1.8056 and 0.6548, respectively, and post-test probability for positive test as 68%. Our investigation suggests that the reproduction of the typical current CTS symptoms in the affected hand during ULNT1 testing, improves estimation of the probability of the presence of this condition, even if this test alone cannot be used to diagnose CTS.

Effects of taping on thumb alignment and force application during PA mobilizations

Manual Therapy; Volume 16 (3); Pages 264-269; June 2011

Work related thumb pain (WRTP) is a major problem among manipulative physiotherapists. Therapists who maintain the thumb joints in an extended alignment during PA mobilization experience less WRTP. The purposes of this study were to investigate what effect taping of the thumbs has on thumb alignment during mobilization and to gain normative data on the mobilization forces applied by student physiotherapists. Forty final year student physiotherapists participated and were asked to apply a grade III PA mobilization onto the C7 vertebra of one of 32 asymptomatic models. Participants were then instructed to apply the same mobilization onto a force measurement instrument, in both the tape and no tape conditions, while the alignment of their metacarpophalangeal (MCP) and interphalangeal (IP) joints was noted via video recorder. Thumb alignment improved in 72.5% of participants post taping, with significant increases in the number of MCP joints maintained in a neutral alignment ($p < 0.05$). The mean peak mobilization force applied by the students was 70.9 N. Taping of the thumbs prior to PA mobilization improved thumb alignment during mobilization in this cohort of undergraduate students, thus potentially influencing one of the contributory factors to WRTP.

Affective brain regions are activated during the processing of pain-related words in migraine patients Pain; Volume 152 (5); May 2011; pages 1104-1113

Several brain areas that constitute the neural matrix of pain can be activated by noxious stimuli and by pain-relevant cues, such as pictures, facial expressions, and pain-related words. Although chronic pain patients are frequently exposed to pain-related words, it remains unclear whether their pain matrix is specifically activated during the processing of such stimuli in comparison to healthy subjects. To answer this question, we compared the neural activations induced by verbal pain descriptors in a sample of migraine patients with activations in healthy controls using functional magnetic resonance imaging. Participants viewed pain-related adjectives and negative, non-pain-related adjectives that were matched for valence and arousal and were instructed to either generate mental images (imagination condition) or to count the number of vowels (distraction condition). In migraine patients, pain-related adjectives as compared with negative adjectives elicited increased activations in the left orbitofrontal cortex and anterior insula during imagination and in the right secondary somatosensory cortex and posterior insula during distraction. More pronounced pain-related activation was observed in affective pain-related regions in the patient as compared with the control group during imagination. During distraction, no differential engagement of single brain structures in response to pain-related words could be observed between groups.

Overall, our findings indicate that there is an involvement of brain regions associated with the affective and sensory-discriminative dimension of pain in the processing of pain-related words in migraine patients, and that the recruitment of those regions associated with pain-related affect is enhanced in patients with chronic pain experiences.

Eight-Year Clinical and Radiological Follow-Up of the Bryan Cervical Disc Arthroplasty Spine; 15 April 2011 - Volume 36 - Issue 8 - p 639–646

Study Design: Single institution, prospective cohort study of 21 patients who underwent single- or bilevel cervical disc arthroplasty for radiculopathy.

Objective: To evaluate the long-term outcome of cervical disc arthroplasty.
Summary of Background Data: There is an increasing trend in the use of cervical arthroplasty; however, no long-term outcome studies exist to verify their safety, functionality, and durability.

Methods: A total of 21 patients underwent 27 total disc arthroplasties using the Bryan cervical disc after anterior cervical discectomy. Clinical and radiological data were obtained from the 8-year postoperative review.

Results: Nineteen of twenty-one patients were able to perform daily activities without limitation. Twenty of twenty-one patients reported fair to excellent outcome according to Odom criteria and 21 of 27 (78%) operated segments were mobile. Functional prostheses moved an average of 10.6°, which was similar to the range of movement of the adjacent non-operated segments of the cervical spine. Heterotopic ossification was evident in 13 of the 27 (48%) operated segments and restricted movement of the prosthesis in nine cases. Five of the six patients who received bi-level arthroplasties developed heterotopic ossification. There was one case of posterior migration of the prosthesis, which did not have any clinical repercussion. No other case showed evidence of migration, subsidence, loosening, or wear. Radiological evidence of adjacent segment degeneration was observed in four patients (19%); however, each of these patients had pre-existing degenerative disc disease at these levels on preoperative imaging.

Conclusion: At 8-year follow-up, the Bryan cervical disc arthroplasty maintains favorable clinical and radiological results, with preservation of movement and satisfactory clinical outcome in the majority of cases. However, the incidence of heterotopic ossification causing restricted range of movement of the prosthesis appears to increase with time, especially in bi-level procedures

Changes in Life Satisfaction and Self-esteem in Patients with Adolescent Idiopathic Scoliosis With and Without Surgical Intervention Spine; 20 April 2011 - Volume 36 - Issue 9 - p 741–745

There have been many studies about the effect of spinal deformity and its various treatments on the mental health of patients with adolescent idiopathic scoliosis. Scoliosis has been reported to have a negative effect on the life quality and mental health of patients. It has also been reported that no matter what the treatment, the existence of scoliosis is a risk factor for depression. However, there has been no report on whether orthopedic spinal surgery affects the life satisfaction and self-esteem of scoliosis patients.

Methods: Forty-six patients with Cobb angles of more than 30° were recruited from a group of patients that were treated from January 2007 to August 2007. Twenty-one patients with Cobb angles of more than 40° underwent surgical correction while the remaining patients received regular observation ($n = 11$) or bracing ($n = 14$). Self-esteem and life satisfaction were assessed before and approximately 1 year after treatment using previously validated scales.

Results: There were no between-group differences in age, sex, or major curve location between the surgically and non-surgically treated groups. The major curve Cobb angle decreased significantly following treatment in the surgically treated ($52^\circ \pm 10^\circ$ to $15^\circ \pm 8$), but not the non-surgically treated group ($37^\circ \pm 9^\circ$ to $39^\circ \pm 8^\circ$) using paired *t* tests. There were no pre-intervention between-group differences in life satisfaction (8 ± 1 vs. 7 ± 10); however, pre-intervention self-esteem scores were significantly higher in the non-surgically treated group (28 ± 4 vs. 25 ± 3). Post intervention, both life satisfaction (9 ± 1) and self-esteem (31 ± 2) scores improved significantly in the surgically treated, but not the non-surgically treated group (7 ± 1 and 24 ± 5 , respectively). Self-esteem levels decreased significantly in the non-surgically treated group. Post intervention self-esteem and life satisfaction scores were significantly higher in the surgically treated than the non-surgically treated group.

Conclusions: These findings indicate that surgical correction of adolescent idiopathic scoliosis in eligible patients can lead not only to curve correction, but also to an increase self-esteem and life satisfaction.

Reducing racial disparities in pain treatment: The role of empathy and perspective-taking Pain; Volume 152 (5); May 2011 Pages 1001-1006

Epidemiological evidence indicates that African Americans receive lower quality pain treatment than European Americans. However, the factors causing these disparities remain unidentified, and solutions to this problem remain elusive. Across three laboratory experiments, we examined the hypotheses that empathy is not only causing pain treatment disparities but that empathy-inducing interventions can reduce these disparities. Undergraduates (Experiments 1 and 2) and nursing professionals (Experiment 3) watched videos of real Black and White patients' genuine facial expressions of pain, provided pain treatment decisions, and reported their feelings of empathy for each patient. The efficacy of an empathy-inducing, perspective-taking intervention at reducing pain treatment disparities was also examined (Experiments 2 and 3). When instructed to attempt to provide patients with the best care, participants exhibited significant pro-White pain treatment biases. However, participants engaged in an empathy-inducing, perspective-taking intervention that instructed them to imagine how patients' pain affected patients' lives exhibited upwards of a 55% reduction in pain treatment bias in comparison to controls. Furthermore, Pro-White empathy biases were highly predictive of pro-White pain treatment biases. The magnitude of the empathy bias experienced predicted the magnitude of the treatment bias exhibited.

These findings suggest that empathy plays a crucial role in racial pain treatment disparities in that it appears not only to be one likely cause of pain treatment disparities but also is an important means for reducing racial disparities in pain treatment.

Symptoms of depression and stress mediate the effect of pain on disability Pain;
Volume 152 (5); May 2011; pages 1044-1051

The mechanism or mechanisms involved in the development of pain-related disability in people with low back pain is unclear. Psychological distress has been identified as one potential pathway by which an episode of pain influences the development of persistent disabling symptoms; however, the relationship has not been formally investigated. This study investigated the causal relationship between pain and disability via psychological distress (and its components depression, stress, and anxiety) by using mediation path analysis. The study sample included 231 participants with sub acute low back pain (6 to 12 weeks' pain duration) who had been recruited for an exercise-based randomized, controlled trial. All participants completed self-report assessments of pain (0–10 numerical rating scale), disability (Roland Morris Disability Questionnaire), and psychological distress (Depression Anxiety and Stress Scale) at baseline and again at 2 follow-up time points (6 and 12 weeks after baseline).

The results of the mediation analysis suggest that approximately 30% of the relationship between sub acute pain and later disability is dependent on the level of patients' psychological distress. The finding that psychological distress only partially (30%) mediated the pain-disability relationship indicates that other factors should also be explored. Further analysis into the components of psycho-logical distress revealed that the symptoms of depression and stress, but not anxiety, are responsible for mediation of the pain-disability relationship. These findings provide an opportunity to decrease the risk of long-term disability through early identification and management of depressive and stress symptoms.

A return-to-sport algorithm for acute hamstring injuries. [Mendiguchia J,](#)
[Brughelli M](#)

201102 12(1):2-14 Language: eng Country: England Head of Rehabilitation
Physical therapy in sport : official journal of the Association of Chartered Physiotherapists in Sports Medicine Department at Athletic Club de Bilbao, Garaioltza 147 CP:48196,
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Acute hamstring injuries are the most prevalent muscle injuries reported in sport. Despite a thorough and concentrated effort to prevent and rehabilitate hamstring injuries, injury occurrence and re-injury rates have not improved over the past 28 years. This failure is most likely due to the following: 1) an over-reliance on treating the symptoms of injury, such as subjective measures of "pain", with drugs and interventions; 2) the risk factors investigated for hamstring injuries have not been related to the actual movements that cause hamstring injuries i.e. not functional; and, 3) a multi-factorial approach to assessment and treatment has not been utilized. The purpose of this clinical commentary is to introduce a model for progression through a return-to-sport rehabilitation following an acute hamstring injury. This model is developed from objective and quantifiable tests (i.e. clinical and functional tests) that are structured into a step-by-step algorithm. In addition, each step in the algorithm includes a treatment protocol. These protocols are meant to help the athlete to improve through each phase safely so that they can achieve the desired goals and progress through the algorithm and back to their chosen sport. We hope that this algorithm can serve as a foundation for future evidence based research and aid in the development of new objective and quantifiable testing methods.

ORIGINAL ARTICLE

Long-term effects of a cognitive-behavioral training program for the management of depressive symptoms among patients in orthopedic inpatient rehabilitation of chronic low back pain: a 2-year follow-up

[Lisa Tlach](#) and [Petra Hampel](#)

Abstract

The aim of the present study was to investigate the 2-year outcome of a cognitive-behavioral training program for the management of depressive symptoms for patients with chronic low back pain (CLBP) and co-existing depressive symptoms compared with the standard rehabilitation. Therefore, a quasi-experimental $3 \times 2 \times 5$ (treatment condition \times gender \times time) repeated measures design with five assessment points (pre-treatment, post-treatment, 6-, 12-, and 24-month follow-up) was employed among $N = 153$ patients with CLBP, aged 33-62 years. Patients were consecutively assigned to one of three treatment conditions: patients with no or mild depressive symptoms were treated with the standard rehabilitation (CG) and patients with moderate or severe depressive symptoms were either treated with the standard rehabilitation (CG_{depr}) or the standard rehabilitation plus cognitive-behavioral management of depressive symptoms (IG_{depr}). Patients in the IG_{depr} significantly improved in mental health up to the 6-month follow-up and in anxiety and depressive symptoms up to the 24-month follow-up. Only short- or mid-term improvements were found in the CG_{depr}. In conclusion, the new cognitive-behavioral training program augmented the long-term rehabilitation success in this highly strained subgroup of patients with CLBP and depressive symptoms.

Prognosis of Acute Idiopathic Neck Pain is Poor: A Systematic Review and Meta-Analysis

Archives of Physical Medicine and Rehabilitation

[Volume 92, Issue 5](#) , Pages 824-829, May 2011

Abstract

Hush JM, Lin CC, Michaleff ZA, Verhagen A, Refshauge KM. Prognosis of acute idiopathic neck pain is poor: a systematic review and meta-analysis.

Objective

To conduct a systematic review and meta-analysis on the prognosis of acute idiopathic neck pain and disability.

Data Sources

EMBASE, CINAHL, Medline, AMED, PEDro, and CENTRAL were searched from inception to July 2009, limited to human studies. Reference lists of relevant systematic reviews were searched by hand. Search terms included: *neck pain, prognosis, inception, cohort, longitudinal, observational, or prospective study* and *randomized controlled trial*.

Study Selection

Eligible studies were longitudinal cohort studies and randomized controlled trials with a no treatment or minimal treatment arm that recruited an inception cohort of acute idiopathic neck pain and reported pain or disability outcomes. Eligibility was determined by 2 authors independently. Seven of 20,085 references were included.

Data Extraction

Pain and disability data were extracted independently by 2 authors. Risk of bias was assessed independently by 2 authors.

Data Synthesis

Statistical pooling showed a weighted mean pain score (0–100) of 64 (95% confidence interval [CI], 61–67) at onset and 35 (95% CI, 32–38) at 6.5 weeks. At 12 months, neck pain severity remained high at 42 (95% CI, 39–45). Disability reduced from a pooled weighted mean score (0–100) at onset of 30 (95% CI, 28–32) to 17 (95% CI, 15–19) by 6.5 weeks, without further improvement at 12 months. Studies varied in length of follow-up, design, and sample size.

Conclusions

This review provides Level I evidence that the prognosis of acute idiopathic neck pain is worse than currently recognized. This evidence can guide primary care clinicians when providing prognostic information to patients. Further research to identify prognostic factors and long-term outcomes from inception cohorts would be valuable.

Influence of acetaminophen and ibuprofen on skeletal muscle adaptations to resistance exercise in older adults. [Trappe TA](#), [Carroll CC](#), [Dickinson JM](#), [Lemoine JK](#), [Haus JM](#), [Sullivan BE](#), [Lee JD](#), [Jemiolo B](#), [Weinheimer EM](#), [Hollon CJ](#)

201103 300(3):R655-62 Language: eng Country: United States Human Performance Laboratory, Ball State Univ., Muncie, IN 47306. ttrappe@bsu.edu.

Evidence suggests that consumption of over-the-counter cyclooxygenase (COX) inhibitors may interfere with the positive effects that resistance exercise training has on reversing sarcopenia in older adults. This study examined the influence of acetaminophen or ibuprofen consumption on muscle mass and strength during 12 wk of knee extensor progressive resistance exercise training in older adults. Thirty-six individuals were randomly assigned to one of three groups and consumed the COX-inhibiting drugs in double-blind placebo-controlled fashion: placebo (67 ± 2 yr; $n = 12$), acetaminophen (64 ± 1 yr; $n = 11$; 4 g/day), and ibuprofen (64 ± 1 yr; $n = 13$; 1.2 g/day). Compliance with the resistance training program (100%) and drug consumption (via digital video observation, 94%), and resistance training intensity were similar ($P > 0.05$) for all three groups. Drug consumption unexpectedly increased muscle volume (acetaminophen: 109 ± 14 cm³, 12.5%; ibuprofen: 84 ± 10 cm³, 10.9%) and muscle strength (acetaminophen: 19 ± 2 kg; ibuprofen: 19 ± 2 kg) to a greater extent ($P < 0.05$) than placebo (muscle volume: 69 ± 12 cm³, 8.6%; muscle strength: 15 ± 2 kg), when controlling for initial muscle size and strength. Follow-up analysis of muscle biopsies taken from the vastus lateralis before and after training showed muscle protein content, muscle water content, and myosin heavy chain distribution were not influenced ($P > 0.05$) by drug consumption. Similarly, muscle content of the two known enzymes potentially targeted by the drugs, COX-1 and -2, was not influenced ($P > 0.05$) by drug consumption, although resistance training did result in a drug-independent increase in COX-1 ($32 \pm 8\%$; $P < 0.05$). Drug consumption did not influence the size of the nonresistance-trained hamstring muscles ($P > 0.05$). Over-the-counter doses of acetaminophen or ibuprofen, when consumed in combination with resistance training, do not inhibit and appear to enhance muscle hypertrophy and strength gains in older adults. The present findings coupled with previous short-term exercise studies provide convincing evidence that the COX pathway(s) are involved in the regulation of muscle protein turnover and muscle mass in humans.

Spine:

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Diagnostics

Effect of Sagittal Alignment on Kinematic Changes and Degree of Disc Degeneration in the Lumbar Spine: An Analysis Using Positional MRI

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ABSTRACT

Study Design. Retrospective analysis using positional MRI.

Objective. To determine the effects of total sagittal lordosis on spinal kinematics and degree of disc degeneration in the lumbar spine.

Summary of Background Data. Changes in sagittal lordosis alter the load on the spine and may affect spinal mobility. There is increasing recognition of the clinical impact that sagittal alignment has on back pain, especially its possible role in accelerating adjacent segment degeneration after spinal fusion. However, its relationship to segmental mobility and degeneration of the lumbar spine has yet to be determined.

Methods. Four hundred and thirty patients who had low back pain with or without leg pain (241 males and 189 females) with a mean age of 42.98 years (range, 16–85 years) were included. Total sagittal lordosis (T12–S1) was divided into three groups; Group A: Straight or Kyphosis (<20°, n = 84), Group B: Normal lordosis (20–50°, n = 294), and Group C: Hyperlordosis (>50°, n = 52). The degree of disc degeneration was graded using midsagittal T2-weighted MR images. Segmental mobility, including translational motion and angular variation, was measured using positional MRI. Their relationship with total segmental lordosis was identified.

Results. When compared with group B, the segmental motion in group C tended to be lower at the border of lordosis and higher at the apex of lordosis, with a significant difference in angular motion at L2–L3. The contrary finding was identified in group A, which had a higher segmental motion at border segments and lower motion at apical segments of lordosis, with significant difference of translational motion at L3–L4 and angular motion at L1–L2. Apical segments contributed more, whereas border segments contributed less to the total angular mobility in more lordotic spines. The opposite was seen in more kyphotic spines. Disc degeneration tended to be greater at all levels in group C, and at L1–L2 and L5–S1 in group A.

Conclusion. Changes in sagittal alignment may lead to kinematic changes in the lumbar spine. This may subsequently influence load bearing and the distribution of disc degeneration at each level. Sagittal alignment, disc degeneration, and segmental mobility likely have a reciprocal influence on one another.

Self-management programs for chronic musculoskeletal pain conditions: A systematic review and meta-analysis

Patient Education and Counselling, 04/07/2011 Evidence Based Medicine

Du S et al. – For arthritis, the findings of this study showed that self-management programs have small to moderate effects in improving pain and disability at the long-term level, but the medium-term effect for disability is not significant. For chronic back pain, there is insufficient evidence to determine the effectiveness of self-management programs.

Methods

- A search of randomized controlled trials was conducted in Medline and Embase from 1970s to 2010
- 2 reviewers independently selected trials, conducted critical appraisal of the methodological quality, and extracted the data
- Meta-analyses were performed using all time-points meta-analysis (ATM)

Results

- 19 trials met inclusion criteria
- For arthritis, the findings of this study showed that self-management programs have small to moderate effects in improving pain and disability at the long-term level, but the medium-term effect for disability is not significant
- For chronic back pain, there is insufficient evidence to determine the effectiveness of self-management programs

Ten year course of low back pain in an adult population-based cohort- The Doetinchem Cohort Study

European Journal of Pain, 04/18/2011

van Oostrom SH et al. – Low back pain in the population is characterized as very dynamic which challenges epidemiological studies highly. Long-term information on the course of back pain is needed to define severe subgroups.

Methods

- Between 1993 and 2007, around 5700 randomly selected men and women in four age groups of originally 20–29, 30–39, 40–49, 50–59 years were measured three times
- Logistic regression analysis was used to study the association of sociodemographic (gender, age, education, work status) and lifestyle characteristics (BMI, smoking, physical activity) with persistent and new episodes of long-standing low back pain

Results

- The prevalence of long-standing low back pain is quite stable over a 10 year period, approximately 20% on population level
- On individual level, around 30% of the population was completely free of low back pain during the entire period, 6% can be characterized as persistent back pain sufferers
- Individuals with persistent and a varying pattern have a more unhealthy lifestyle (BMI and smoking) than those without low back pain
- Age, smoking, obesity and not having a paid job are associated with 10-year persistent back pain in the general population, whereas age and not having a paid job are associated in those with long-lasting back pain at baseline
- New episodes of long-standing back pain are relatively frequent among women and smokers

Spinal manipulative therapy for chronic low-back pain

Rubinstein SM, van Middelkoop M, Assendelft WJJ, de Boer MR, van Tulder MW

Spinal manipulative therapy for chronic low-back pain

Spinal manipulative therapy (SMT) is an intervention that is widely practiced by a variety of health care professionals worldwide. The effectiveness of this form of therapy for the management of chronic low-back pain has come under dispute.

Low-back pain is a common and disabling disorder, which represents a great burden to the individual and society. It often results in reduced quality of life, time lost from work and substantial medical expense. In this review, chronic low-back pain is defined as low-back pain lasting longer than 12 weeks. For this review, we only included cases of low-back pain that were not caused by known underlying conditions, for example, infection, tumour, or fracture. We also included patients whose pain was predominantly in the lower back, but may also have radiated (spread) into the buttocks and legs.

SMT is known as a "hands-on" treatment of the spine, which includes both manipulation and mobilisation. In manual mobilisations, the therapist moves the patient's spine within their range of motion. They use slow, passive movements, starting with a small range and gradually increasing to a larger range of motion. Manipulation is a passive technique where the therapist applies a specifically directed manual impulse, or thrust, to a joint, at or near the end of the passive (or physiological) range of motion. This is often accompanied by an audible 'crack'.

In this updated review, we identified 26 randomised controlled trials (represented by 6070 participants) that assessed the effects of SMT in patients with chronic low-back pain. Treatment was delivered by a variety of practitioners, including chiropractors, manual therapists and osteopaths. Only nine trials were considered to have a low risk of bias. In other words, results in which we could put some confidence.

The results of this review demonstrate that SMT appears to be as effective as other common therapies prescribed for chronic low-back pain, such as, exercise therapy, standard medical care or physiotherapy. However, it is less clear how it compares to inert interventions or sham (placebo) treatment because there are only a few studies, typically with a high risk of bias, which investigated these factors. Approximately two-thirds of the studies had a high risk of bias, which means we cannot be completely confident with their results. Furthermore, no serious complications were observed with SMT.

In summary, SMT appears to be no better or worse than other existing therapies for patients with chronic low-back pain.

This is a Cochrane review abstract and plain language summary, prepared and maintained by The Cochrane Collaboration, currently published in The Cochrane Database of Systematic Reviews 2011 Issue 5, Copyright © 2011 The Cochrane Collaboration. Published by John Wiley and Sons, Ltd.. The full text of the review is available in [The Cochrane Library](#) (ISSN 1464-780X).

Etiology of Chronic Low Back Pain in Patients Having Undergone Lumbar Fusion

Pain Medicine, 04/20/2011

DePalma MJ et al. – In patients' recalcitrant to non-interventional care, the sacroiliac joint is the most likely source of low back pain after lumbar fusion followed by internal disc disruption, zygapohyseal joint pain, and soft tissue irritation due to fusion hardware. Sacroiliac joint pain is more common after fusion, while internal disc disruption is more common in non-fusion patients.

Methods

- Retrospective chart review
- University spine center
- Patients presenting to a community-based, multidisciplinary, academic spine center (65.9% female, mean age 54.4 years, median pain duration 12 months)
- Charts of consecutive low back pain cases completing diagnostic spinal procedures including provocation discography and zygapohyseal joint, sacroiliac joint, and fusion hardware blockade were retrospectively reviewed
- Based on the results of discography and/or diagnostic blockades, subjects were classified with internal disc disruption, zygapohyseal joint pain, sacroiliac joint pain, or fusion hardware related pain

Results

- The diagnoses of 28 fusion cases identified from 170 low back pain patients undergoing diagnostic procedures included 12 with sacroiliac joint pain, seven with internal disc disruption, five with zygapohyseal joint pain, and four due to soft tissue irritation from fusion hardware
- No significant differences were noted in zygapohyseal joint mediated pain with and without fusion history
- Mean ages of patients were similar with and without fusion history for cases diagnosed as internal disc disruption

Cognitive Behavioral Treatment for Low Back Pain

Case Study and Commentary, *Julia M. Hush, PhD, and Michael K Nicholas, PhD*

Abstract

- *Objective*: To review principles of behavioral management of nonspecific low back pain.
- *Methods*: Case presentation and review of the literature.
- *Results*: Low back pain is a common musculoskeletal disorder characterized by symptoms of pain, ache, and stiffness in the lumbosacral spine. The majority of those with back pain are classified as having nonspecific low back pain. The main features of guideline-based primary care for acute nonspecific back pain are provision of information and assurance about the condition and encouragement to maintain normal daily activity and work, in conjunction with simple analgesia. If recovery is slow or incomplete by 4 to 6 weeks, further assessment is required to check that specific pathology has not been missed and to identify possible psychosocial barriers. For patients with heightened psychosocial features at the subacute or chronic stage, cognitive behavioral treatment is recommended, with more intensive and multidisciplinary programs required for more disabled or complex cases. Cognitive behavioral management involves individualized advice and reassurance, activity upgrading using pacing, rationalization of medication, cognitive restructuring, and management of psychological distress and associated problems such as sleep disturbance. The patient is taught skills to gradually return to normal activity and work, even if symptoms have not fully resolved, and to utilize helpful coping strategies to manage the condition and prevent relapses.
- *Conclusion*: Early identification of those who require cognitive behavioral treatment is critical to prevent persistent disabling chronic pain.

The Effects of Exercise for the Prevention of Overuse Anterior Knee Pain: A Randomized Controlled Trial

American Journal of Sports Medicine, 05/12/2011 Clinical Article

Coppack RJ et al. – A simple set of lower limb stretching and strengthening exercises resulted in a substantial and safe reduction in the incidence of Anterior knee pain (AKP) in a young military population undertaking a physical conditioning program. Such exercises could also be beneficial for preventing this common injury among nonmilitary participants in recreational physical activity.

Methods

- A single-blind cluster randomized controlled trial was performed in 39 male and 11 female training groups (median age: 19.7 years; interquartile range, 17–25) undergoing phase 1 of army recruit training.
- Each group was randomly assigned to either an intervention (n = 759) or control (n = 743) protocol.
- The intervention consisted of 4 strengthening and 4 stretching exercises completed during supervised physical training lessons (7 per week).
- The control group followed the existing training syllabus warm-up exercises.
- The primary outcome was a diagnosis of AKP during the 14-week training program.

Results

- Forty-six participants (3.1%; 95% confidence interval [CI], 2.3–4.1) were diagnosed with AKP.
- There were 36 (4.8%; 95%CI, 3.5–6.7) new cases of AKP in the control group and 10 (1.3%; 0.7–2.4) in the intervention group.
- There was a 75% reduction in AKP risk in the intervention group (unadjusted hazard ratio = 0.25; 95% CI, 0.13–0.52; P < .001).
- Three participants (0.4%) from the intervention group were discharged from the military for medical reasons compared to 25 (3.4%) in the control group.

What Does Local Tenderness Say About the Origin of Pain? An Investigation of Cervical Zygapophysial Joint Pain *Full Text*

Anesthesia & Analgesia, 02/26/2010

1. Andreas Siegenthaler, MD*
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BACKGROUND: Mechanical pain sensitivity is assessed in every patient with pain, either by palpation or by quantitative pressure algometry. Despite widespread use, no studies have formally addressed the usefulness of this practice for the identification of the source of pain. We tested the hypothesis that assessing mechanical pain sensitivity distinguishes damaged from healthy cervical zygapophysial (facet) joints.

METHODS: Thirty-three patients with chronic unilateral neck pain were studied. Pressure pain thresholds (PPTs) were assessed bilaterally at all cervical zygapophysial joints. The diagnosis of zygapophysial joint pain was made by selective nerve blocks. Primary analysis was the comparison of the PPT between symptomatic and contralateral asymptomatic joints. The secondary end points were as follows: differences in PPT between affected and asymptomatic joints of the same side of patients with zygapophysial joint pain; differences in PPT at the painful side between patients with and without zygapophysial joint pain; and sensitivity and specificity of PPT for 2 different cutoffs (difference in PPT between affected and contralateral side by 1 and 30 kPa, meaning that the test was considered positive if the difference in PPT between painful and contralateral side was negative by at least 1 and 30 kPa, respectively). The PPT of patients was also compared with the PPT of 12 pain-free subjects.

RESULTS: Zygapophysial joint pain was present in 14 patients. In these cases, the difference in mean PPT between affected and contralateral side (primary analysis) was -6.2 kPa (95% confidence interval: -19.5 to 7.2 , $P = 0.34$). In addition, the secondary analyses yielded no statistically significant differences. For the cutoff of 1 kPa, sensitivity and specificity of PPT were 67% and 16%, respectively, resulting in a positive likelihood ratio of 0.79 and a diagnostic confidence of 38%. When the cutoff of 30 kPa was considered, the sensitivity decreased to only 13%, whereas the specificity increased to 95%, resulting in a positive likelihood ratio of 2.53 and a diagnostic confidence of 67%. The PPT was significantly lower in patients than in pain-free subjects ($P < 0.001$).

CONCLUSIONS: Assessing mechanical pain sensitivity is not diagnostic for cervical zygapophysial joint pain. The finding should stimulate further research into a diagnostic tool that is widely used in the clinical examination of patients with pain.

Prescription opioid analgesics rapidly change the human brain

Pain, 05/03/2011

Younger JW et al. – The results add to a growing body of literature showing that opioid exposure causes structural and functional changes in reward– and affect–processing circuitry. Morphologic changes occur rapidly in humans during new exposure to prescription opioid analgesics.

Methods

- Longitudinal, magnetic resonance imaging study
- 10 individuals with chronic low back pain were administered oral morphine daily for 1 month
- High–resolution anatomical images of the brain were acquired immediately before and after the morphine administration period

Results

- Regional changes in gray matter volume were assessed on the whole brain using tensor–based morphometry, and those significant regional changes were then independently tested for correlation with morphine dosage
- Thirteen regions evidenced significant volumetric change, and degree of change in several of the regions was correlated with morphine dosage
- Dosage–correlated volumetric decrease was observed primarily in the right amygdala
- Dosage–correlated volumetric increase was seen in the right hypothalamus, left inferior frontal gyrus, right ventral posterior cingulate, and right caudal pons
- Follow–up scans that were conducted an average of 4.7 months after cessation of opioids demonstrated many of the morphine–induced changes to be persistent.
- In a separate study, 9 individuals consuming blinded placebo capsules for 6 weeks evidenced no significant morphologic changes over time

The impact of lumbar scoliosis on pain, function and health-related quality of life in postmenopausal women

European Spine Journal, 05/16/2011

Urrutia J et al. – In postmenopausal women with mild and moderate lumbar curves, Cobb angle had no influence on pain, function and quality of life (QOL); age and body mass index had small effect.

Methods

- A visual analog pain scale assessment (VAS) for lumbar and leg pain, an Oswestry disability index (ODI) and a standard version of the Medical Outcome Study Short Form-36 (SF-36) questionnaire were sent by mail to 261 women of age 50 years and older, consecutively evaluated with dual-energy radiograph absorptiometry (DXA) scan images
- 138 patients (32 with lumbar curves 10° or bigger) returned the questionnaires
- Differences in lumbar VAS, leg VAS, ODI and SF-36 values between groups of patients with curves $<10^\circ$, 10° – 19° and $\geq 20^\circ$ were evaluated
- Correlation analyses of the Cobb angle, age and body mass index (BMI) with VAS, ODI and SF-36 values, and multivariate regression analysis were performed

Results

- Patients with curves $<10^\circ$, 10° – 19° and $\geq 20^\circ$ had no significant differences in lumbar or leg VAS, ODI or SF-36 values
- ODI values correlated with age and BMI; SF-36 values correlated with BMI only; lumbar and leg VAS values did not correlate with lumbar curvature, age or BMI.
- Regression disclosed that Cobb angle values did not influence ODI, SF-36 or VAS values

The impact of adult scoliosis on pain, function and health-related quality of life (QOL) has not been clearly defined. A population-based study using widely applied screening tools could better reflect the impact of adult scoliosis. In this study, a visual analog pain scale assessment (VAS) for lumbar and leg pain, an Oswestry disability index (ODI) and a standard version of the Medical Outcome Study Short Form-36 (SF-36) questionnaire were sent by mail to 261 women of age 50 years and older, consecutively evaluated with dual-energy radiograph absorptiometry (DXA) scan images. 138 patients (32 with lumbar curves 10° or bigger) returned the questionnaires. Differences in lumbar VAS, leg VAS, ODI and SF-36 values between groups of patients with curves $<10^\circ$, 10° – 19° and $\geq 20^\circ$ were evaluated. Correlation analyses of the Cobb angle, age and body mass index (BMI) with VAS, ODI and SF-36 values, and multivariate regression analysis were performed. Patients with curves $<10^\circ$, 10° – 19° and $\geq 20^\circ$ had no significant differences in lumbar or leg VAS, ODI or SF-36 values. ODI values correlated with age and BMI; SF-36 values correlated with BMI only; lumbar and leg VAS values did not correlate with lumbar curvature, age or BMI. Regression disclosed that Cobb angle values did not influence ODI, SF-36 or VAS values. In postmenopausal women with mild and moderate lumbar curves, Cobb angle had no influence on pain, function and QOL; age and BMI had small effect.

The effect of acute back muscle fatigue on postural control strategy in people with and without recurrent low back pain

European Spine Journal, 05/16/2011

Johanson E et al. – People with low back pain (LBP) continued to rely strongly on ankle proprioception regardless of the testing conditions. These findings suggest that impaired back muscle function, as a result of acute muscle fatigue or pain, may lead to an inability to adapt postural control strategies to the prevailing conditions.

Methods

- Postural sway was evaluated on a force platform in 16 healthy subjects and 16 individuals with recurrent LBP during a control (Condition 1) and a back muscle fatigue condition (Condition 2)
- Back muscle fatigue was induced by performing a modified Biering–Sørensen test
- Ankle and back muscle vibration, a potent stimulus for muscle spindles, was used to differentiate proprioceptive postural control strategies during standing on a stable and unstable support surface, where the latter was achieved by placing a foam pad under the feet

Results

- Ankle signals were predominantly used for postural control in all subjects although, in each condition, their influence was greater in people with LBP compared to healthy subjects ($p < 0.001$)
- The latter group adapted their postural control strategy when standing on an unstable surface so that input from back muscles increased ($p < 0.001$)
- Such adaptation was not observed when the back muscles were fatigued
- People with LBP continued to rely strongly on ankle proprioception regardless of the testing conditions

Back muscle fatigue decreases the postural stability during quiet standing, but it is not known whether this fatigue-induced postural instability is due to an altered proprioceptive postural control strategy. Therefore, the aim of the study was to evaluate if acute back muscle fatigue may be a mechanism to induce or sustain a suboptimal proprioceptive postural control strategy in people with and without recurrent low back pain (LBP). Postural sway was evaluated on a force platform in 16 healthy subjects and 16 individuals with recurrent LBP during a control (Condition 1) and a back muscle fatigue condition (Condition 2). Back muscle fatigue was induced by performing a modified Biering-Sørensen test. Ankle and back muscle vibration, a potent stimulus for muscle spindles, was used to differentiate proprioceptive postural control strategies during standing on a stable and unstable support surface, where the latter was achieved by placing a foam pad under the feet. Ankle signals were predominantly used for postural control in all subjects although, in each condition, their influence was greater in people with LBP compared to healthy subjects ($p < 0.001$). The latter group adapted their postural control strategy when standing on an unstable surface so that input from back muscles increased ($p < 0.001$). However, such adaptation was not observed when the back muscles were fatigued. Furthermore, people with LBP continued to rely strongly on ankle proprioception regardless of the testing conditions. In conclusion, these findings suggest that impaired back muscle function, as a result of acute muscle fatigue or pain, may lead to an inability to adapt postural control strategies to the prevailing conditions.

Physiological and clinical changes after therapeutic massage of the neck and shoulders

Manual Therapy , 05/16/2011

Sefton JM et al. – Decreases in the normalized electromyography (EMG) amplitude during MVIC of the upper trapezius muscle; and increases in cervical ROM in all directions assessed occurred after therapeutic massage (TM), but not after the LT or C interventions.

Little is known regarding the physiological and clinical effects of therapeutic massage (TM) even though it is often prescribed for musculoskeletal complaints such as chronic neck pain. This study investigated the influence of a standardized clinical neck/shoulder TM intervention on physiological measures assessing α -motoneurone pool excitability, muscle activity; and the clinical measure of range of motion (ROM) compared to a light touch and control intervention. Flexor carpi radialis (FCR) α -motoneurone pool excitability (Hoffmann reflex), electromyography (EMG) signal amplitude of the upper trapezius during maximal muscle activity, and cervical ROM were used to assess possible physiological changes and clinical effects of TM. Sixteen healthy adults participated in three, 20 min interventions: control (C), light touch (LT) and therapeutic massage (TM). Analysis of Covariance indicated a decrease in FCR α -motoneurone pool excitability after TM, compared to both the LT ($p = 0.0003$) or C ($p = 0.0007$) interventions. EMG signal amplitude decreased after TM by 13% ($p < 0.0001$), when compared to the control, and 12% ($p < 0.0001$) as compared to LT intervention. The TM intervention produced increases in cervical ROM in all directions assessed: flexion ($p < 0.0001$), lateral flexion ($p < 0.0001$), extension ($p < 0.0001$), and rotation ($p < 0.0001$). TM of the neck/shoulders reduced the α -motoneurone pool excitability of the flexor carpi radialis after TM, but not after the LT or C interventions. Moreover, decreases in the normalized EMG amplitude during MVIC of the upper trapezius muscle; and increases in cervical ROM in all directions assessed occurred after TM, but not after the LT or C interventions.

Manual therapy Pages 240-245 (June 2011)

Validity and reliability of clinical tests for assessing hip passive stiffness

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Abstract

Inadequate levels of hip passive joint stiffness have been associated with the occurrence of movement dysfunction, development of pathologies and reduction in performance. Clinical tests, designed to evaluate hip joint stiffness, may allow the identification of improper stiffness levels. The purpose of this study was to determine the concurrent validity as well as the intra- and inter-examiners reliabilities of clinical measures used to assess hip passive stiffness during internal rotation. Fifteen healthy participants were subjected to test-retest evaluations by two examiners. Two clinical measures were performed: 'position of first detectable resistance' and 'change in passive resistance torque'. The results of these tests were compared to the passive stiffness measured with an isokinetic dynamometer (gold standard measure). A significant correlation was found between the stiffness measured with the isokinetic dynamometer and the clinical measures of 'position of first detectable resistance' ($r = -0.85$ to -0.86 , $p < 0.001$) and 'change in passive resistance torque' ($r = 0.78$ to 0.84 , $p \leq 0.001$). The Intraclass Correlation Coefficients for intra- and inter-examiners reliabilities varied from 0.95 to 0.99. Thus, the results demonstrated that the clinical measures have adequate validity and reliability for obtaining information on hip passive stiffness during internal rotation.



Neck/shoulder pain is more strongly related to depressed mood in adolescent girls than in boys

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Abstract

A cross-sectional study of 1258, 14 year old girls and boys used self-report and physical examination measures to assess neck/shoulder pain in the last month, depressed mood, physical fitness, body composition, self-efficacy, global self-worth, family functioning and social advantage. The data was used to compare the relationship between depressed mood and neck/shoulder pain (NSP) in adolescent girls and boys.

The prevalence of NSP in girls (34%, 211/621) was significantly greater than in boys (21%, 134/637; $p < .001$). After controlling for covariates, girls with medium (OR = 4.28; CI = 2.31–7.92; $p < .001$) and high depressed mood (OR = 8.63; CI = 4.39–16.98; $p < .001$) were significantly more likely to report NSP than girls with low depressed mood. Depressed mood was also a significant correlate of NSP in boys after controlling for covariates, although the association was substantially weaker (OR = 2.44; CI = 1.29–4.61; $p < .001$).

After controlling for relevant biological, psychological and social covariates, depressed mood was a significant correlate of NSP in both sexes; but the association between depressed mood and NSP was significantly stronger for girls than for boys.

Head eye co-ordination and gaze stability in subjects with persistent whiplash associated disorders

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Received 29 March 2010; received in revised form 3 November 2010; accepted 9 November 2010. published online 24 December 2010.

Abstract

Symptoms of dizziness, unsteadiness and visual disturbances are frequent complaints in persons with persistent whiplash associated disorders. This study investigated eye, head co-ordination and gaze stability in subjects with persistent whiplash ($n = 20$) and asymptomatic controls ($n = 20$). Wireless motion sensors and electro-oculography were used to measure: head rotation during unconstrained head movement, head rotation during gaze stability and sequential head and eye movements. Ten control subjects participated in a repeatability study (two occasions one week apart).

Between-day repeatability was acceptable ($ICC > 0.6$) for most measures. The whiplash group had significantly less maximal eye angle to the left, range of head movement during the gaze stability task and decreased velocity of head movement in head eye co-ordination and gaze stability tasks compared to the control group ($p < 0.01$). There were significant correlations ($r > 0.55$) between both unrestrained neck movement and neck pain and head movement and velocity in the whiplash group. Deficits in gaze stability and head eye co-ordination may be related to disturbed reflex activity associated with decreased head range of motion and/or neck pain. Further research is required to explore the mechanisms behind these deficits, the nature of changes over time and the tests' ability to measure change in response to rehabilitation.

Upper limb neurodynamic test 1 and symptoms reproduction in carpal tunnel syndrome. A validity study☆

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Received 9 December 2009; received in revised form 14 September 2010; accepted 9 November 2010. published online 24 December 2010.

Abstract

The aim of this study was to estimate the validity of the Upper Limb Neurodynamic Test 1 (ULNT1) for the diagnosis of Carpal Tunnel Syndrome (CTS) with blind comparison to a reference criterion of a compatible clinical presentation and abnormal nerve conduction. 47 subjects with suspected CTS were enrolled. All patients were tested with nerve conduction studies and ULNT1. Considering results as positive in the presence of reproduction of symptoms on affected upper limb, or side-to-side differences in elbow extension, or symptoms modified by lateral neck side-bending, we estimated sensitivity as 91.67%, specificity as 15%, positive likelihood ratio as 1.0784, negative likelihood ratio as 0.5556, and post-test probability for negative test as 40%. Using a new criterion, i.e. the reproduction of symptoms only in the first three digits of the affected hand, we estimated sensitivity as 54.17%, specificity as 70%, positive and negative likelihood ratios as 1.8056 and 0.6548, respectively, and post-test probability for positive test as 68%. Our investigation suggests that the reproduction of the typical current CTS symptoms in the affected hand during ULNT1 testing, improves estimation of the probability of the presence of this condition, even if this test alone cannot be used to diagnose CTS.

Effects of taping on thumb alignment and force application during PA mobilisations★

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Received 4 March 2010; received in revised form 8 November 2010; accepted 10 November 2010. published online 24 December 2010.

Abstract

Work related thumb pain (WRTP) is a major problem among manipulative physiotherapists. Therapists who maintain the thumb joints in an extended alignment during PA mobilisation experience less WRTP. The purposes of this study were to investigate what effect taping of the thumbs has on thumb alignment during mobilisation and to gain normative data on the mobilisation forces applied by student physiotherapists. Forty final year student physiotherapists participated and were asked to apply a grade III PA mobilisation onto the C7 vertebra of one of 32 asymptomatic models. Participants were then instructed to apply the same mobilisation onto a force measurement instrument, in both the tape and no tape conditions, while the alignment of their metacarpophalangeal (MCP) and interphalangeal (IP) joints was noted via video recorder. Thumb alignment improved in 72.5% of participants post taping, with significant increases in the number of MCP joints maintained in a neutral alignment ($p < 0.05$). The mean peak mobilisation force applied by the students was 70.9 N. Taping of the thumbs prior to PA mobilisation improved thumb alignment during mobilisation in this cohort of undergraduate students, thus potentially influencing one of the contributory factors to WRTP.

The slow and fast components of postural sway in chronic neck pain

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Received 3 June 2010; received in revised form 26 October 2010; accepted 20 November 2010. published online 27 December 2010.

Abstract

Background

Several studies have reported altered postural control in people with neck pain. The aim of this study was to increase the understanding of the nature of altered postural control in neck pain by studying the slow and fast components of body sway.

Methods

Subjects with whiplash associated disorders (WAD, $n = 21$) and chronic non-specific neck pain (NS, $n = 24$) were compared to healthy controls (CON, $n = 21$) in this cross-sectional study. The magnitudes of the slow and fast sway components were assessed in Rhomberg quiet stance for 30 s on a force plate with eyes closed. We also investigated associations between postural sway and symptoms, self-ratings of functioning and kinesiophobia.

Results

Increased magnitude of the slow sway component was found in WAD, but not in NS. Greater magnitude of the slow component in WAD was associated with poorer physical functioning, including balance disturbances, and more severe sensory symptoms.

Conclusions

Increased magnitude of the slow sway component implies an aberration in sensory feedback or processing of sensory information in WAD. The associations between postural sway and self-rated characteristics support the clinical validity of the test. Further investigation into NS, involving a longer test time is warranted.

Magnetic resonance imaging assessment of regional abdominal muscle function in elite AFL players with and without low back pain

[Julie Hides](#)^{ac}  , [Brita Hughes](#)^b, [Warren Stanton](#)^{ac}

Received 29 April 2010; received in revised form 12 November 2010; accepted 19 November 2010. published online 27 December 2010.

Abstract

Changes in the motor control of trunk muscles have been identified in people with low back pain (LBP) including elite football players. Previous research has found functional differences in the anatomical regions of abdominal muscles; however, this has not been examined in football players with LBP. The aim of this study was to investigate if the ability to draw-in the abdominal wall is altered among football players with LBP, and to determine if there are functional differences between the middle and lower abdominal regions in participants with and without LBP. Forty-three elite Australian Football League players were imaged using magnetic resonance imaging (MRI) as they drew in their abdominal walls, and the trunk cross-sectional area (CSA) was measured in relaxed and contracted states. At the lower region, participants with LBP (1.1%) reduced their trunk CSA to a lesser extent than those without LBP (3.2%) ($P = 0.018$). The results also showed that the draw-in of the abdominal wall was smaller in Region 1 (8.8%) compared to Region 2 (16.0%) and Region 3 (19.7%) ($P < 0.001$). This study provides evidence of regional differences in motor control and altered control of the lower region in participants with LBP. This may direct physiotherapists, especially those treating athletes, to focus on the lower abdominal region in those with LBP.

The impact of Masters education in manual and manipulative therapy and the 'knowledge acquisition model'



Jo Perry  , [Ann Green](#), [Karen Harrison](#)

Received 28 May 2010; received in revised form 19 November 2010; accepted 13 December 2010. published online 20 January 2011.

Abstract

This study aimed to explore the professional and personal impact that a clinical Masters program of manipulative therapy education had on the lives of individuals who had undertaken the course and was a follow-on study of participants' career pathways following Masters education ([Green et al., 2008](#)). Seven graduates from the program took part in a focus group. The narrative data obtained was independently verified prior to two researchers conducting a systematic, thematic content analysis. Three key themes were identified and the 'knowledge acquisition model' developed. Findings revealed that studying at Master's level is a 'life changing' and rewarding experience that develops individuals in three key domains; professionally, personally and intellectually. During Masters education students described a journey of multi-compartmental development whereby their knowledge-base was challenged and their existing cognitive framework deconstructed. Progression through the program resulted in the development of a new, clearer framework for thinking and understanding that extended, universally, into all aspects of their lives; clinically, managerially, emotionally, politically and intellectually. Participants also described two cultures for career progression in the UK National Health Service (NHS). Findings could help students considering undertaking Masters level education, employers and clinical mentors of these practitioners and academic educators.

A rationale for the provision of extrinsic feedback towards management of low back pain

[Daniel Cury Ribeiro](#) , [Gisela Solea](#), [J. Haxby Abbott](#), [Stephan Milosavljevic](#)

Received 27 October 2010; received in revised form 27 January 2011; accepted 28 January 2011. published online 28 February 2011.

Abstract

Low back pain (LBP) is associated with dysfunction of global and local muscle systems, feedback and feedforward postural control mechanisms. Physiotherapists include the use of feedback as part of treatment protocols. Such feedback can focus on a variety of neuromuscular impairments, although the literature related to feedback on the management of LBP has focused mainly on local muscle system impairments. Furthermore, there are various characteristics of feedback that can lead to motor control enhancement or deterioration. The aim of this manuscript is to present a rationale for feedback provision as a rehabilitation tool on the management of LBP. Feedback provision should focus on the main neuromuscular impairment presented by the patient. The suggested rationale describes decision-making stages for the use and progress of feedback interventions. Local muscle system impairment might benefit more from parameter feedback provision, while global muscle system and feedback mechanism impairments may benefit better from program feedback. The described rationale has the potential to help clinicians select the appropriate feedback for the treatment of their patients. Additionally, the presented rationale could be used by researchers to assess how different forms of feedback provision impact on clinical outcomes.

The prevalence of MRI-defined spinal pathoanatomies and their association with Modic changes in individuals seeking care for low back pain

European Spine Journal, 05/16/2011

Abstract

Modic changes are of increasing interest, however their age and gender prevalence are not well described. To date, the associations between Modic changes and other common vertebral pathologies have only been described in small samples ($n < 100$). Our aim was, in a large dataset of people with low back pain, to (1) describe the prevalence of a range of spinal pathoanatomies, and (2) examine the association between Modic changes and stages of intervertebral disc (IVD) pathology. Common pathologies were coded from the lumbar spine MRIs from 4,233 consecutive people imaged while attending a publicly-funded secondary care outpatient facility in Denmark. Prevalence data were calculated by pathology and by vertebral level. Prevalence was also calculated by age and gender categories for Modic changes. The association between stages of IVD pathology (degeneration, bulge, herniation) and Modic changes at L4/5 and L5/S1 was expressed using prevalence ratios (PR) and 95% confidence intervals. The prevalence of Modic changes and IVD pathology were greater in L4/5 and L5/S1, compared with the upper lumbar spine. There was no significant gender difference in prevalence of Modic changes ($p = 0.11$). The prevalence of IVD disc pathology occurring concurrently with Modic changes ranged from 11.5 to 17.5% (Type 1), 8.5 to 12.7% (Type 2) and 17.1 to 25.6% (Type 1 and/or 2) while the prevalence occurring in the absence of Modic changes ranged from 0.5 to 6.3% (Type 1), 0.3 to 4.9 (Type 2), 0.8 to 9.7% (Type 1 and/or 2). The associated PR for IVD pathology occurring concurrently with Modic changes ranged from 1.8 to 29.2 ($p < 0.05$). The highest PR (29.2) was between degeneration and Modic changes, indicating that it is rare for Modic changes to occur without disc degeneration. Spinal pathoanatomy was common in this population, particularly IVD pathologies, and a consistent trend of a relatively greater prevalence in the lower lumbar spine was identified. Modic changes were more likely to be present among individuals with IVD pathology than without, which may implicate mechanical factors as being one aetiological pathway for Modic changes, although other hypotheses may equally explain this association.

Treatment of migraine: update on new therapies

Current Opinion in Neurology, 05/05/2011

Magis D et al. – Drugs with a better efficacy or side-effect profile than triptans may soon become available for acute treatment. The future may also look brighter for some of the very disabled chronic migraineurs thanks to novel drug and neuromodulation therapies.

- The oral calcitonine gene-related peptide antagonist telcagepant is efficacious in acute treatment.
- Triptans, as other drugs, are more efficient if taken early but nonsteroidal anti-inflammatory drugs and analgesics remain useful for acute treatment, according to several meta-analyses.
- Single-pulse transcranial magnetic stimulation during the aura rendered more patients pain-free (39%) than sham stimulation (22%) in one study.
- Topiramate could be effective for migrainous vertigo, but it did not prevent transformation to chronic migraine in patients with high attack frequency.
- Onabotulinumtoxin A was effective for chronic migraine and well tolerated, but the therapeutic gain over placebo was modest; the clinical profile of responders remains to be determined before widespread use.
- Occipital nerve stimulation was effective in intractable chronic migraine with 39% of responders compared to 6% after sham stimulation. This and other neuromodulation techniques, such as sphenopalatine ganglion stimulation, are promising treatments for medically refractory patients but large controlled trials are necessary.
- One study suggests that outcome of patent foramen ovale closure in migraine might depend on anatomic and functional characteristics.
- Purpose of review: This review provides a comprehensive selection of the latest clinical trial results in antimigraine treatment.
- Recent findings: The oral calcitonine gene-related peptide antagonist telcagepant is efficacious in acute treatment. Compared to triptans, its efficacy is almost comparable but its tolerance is superior. The same is true for the 5HT-1F agonist lasmiditan, another agent devoid of vascular effects. Triptans, as other drugs, are more efficient if taken early but nonsteroidal anti-inflammatory drugs and analgesics remain useful for acute treatment, according to several meta-analyses. Single-pulse transcranial magnetic stimulation during the aura rendered more patients pain-free (39%) than sham stimulation (22%) in one study. Topiramate could be effective for migrainous vertigo, but it did not prevent transformation to chronic migraine in patients with high attack frequency. Onabotulinumtoxin A was effective for chronic migraine and well tolerated, but the therapeutic gain over placebo was modest; the clinical profile of responders remains to be determined before widespread use. Occipital nerve stimulation was effective in intractable chronic migraine with 39% of responders compared to 6% after sham stimulation. This and other neuromodulation techniques, such as sphenopalatine ganglion stimulation, are promising treatments for medically refractory patients but large controlled trials are necessary. One study suggests that outcome of patent foramen ovale closure in migraine might depend on anatomic and functional characteristics.
- Summary: Drugs with a better efficacy or side-effect profile than triptans may soon become available for acute treatment. The future may also look brighter for some of the very disabled chronic migraineurs thanks to novel drug and neuromodulation therapies.

The Efficacy of Acupressure for Symptom Management: A Systematic Review

Journal of Pain and Symptom Management, 05/03/2011 Evidence Based Medicine

Lee EJ et al. – Acupressure may be a useful strategy for the management of multiple symptoms in a variety of patient populations, but rigorous trials are needed. Inclusion of acupressure as an intervention may improve patient outcomes.

Methods

- A literature search was conducted in the Cumulative Index to Nursing and Allied Health Literature, Medline, and PubMed using the key words acupressure, clinical trial, human, and/or randomized
- Randomized clinical trials (RCTs) published between January 1, 2000 and January 31, 2010, which used acupressure as the sole intervention for one group, were included when they were written in English and when there were four or more studies of the efficacy of the acupressure for that particular symptom

Results

- 43 studies were included in this review
- Investigators in 16 of 23 studies concluded acupressure was effective, primarily for the management of nausea and vomiting in patients during pregnancy and during chemotherapy
- Investigators in nine of 10 studies concluded that acupressure was effective for pain in patients with dysmenorrhea, during labor and after trauma
- Investigators of four studies concluded that acupressure was effective in the management of dyspnea and investigators in six studies concluded that acupressure was effective in improving fatigue and reducing insomnia in a variety of populations

Pain-induced Changes in the Activity of the Cervical Extensor Muscles Evaluated by Muscle Functional Magnetic Resonance Imaging

The Clinical Journal of Pain, 05/10/2011

Cagnie B et al. – This is the first study that has shown pain to immediately affect the activity of both deep and superficial cervical extensor muscle layers during a cervical extension exercise. The findings support recommendations for evaluation of cervical extensor muscle function early in the management of painful cervical spine injuries.

Methods

- The activity of the multifidus, semispinalis cervicis, semispinalis capitis, and splenius capitis muscles was investigated bilaterally at 2 cervical levels (C2 to C3 and C7 to T1) in 15 healthy individuals
- Measurements were taken at rest and after the performance of a cervical extension exercise without and with induced pain of the right upper trapezius (intramuscular injection of hypertonic saline)

Results

- In the pain condition, the activity of the multifidus/semispinalis cervicis was reduced bilaterally at the C7 to T1 level ($P=0.045$)
- For the semispinalis capitis, there were no significant differences between both conditions
- The splenius capitis showed a significantly higher T2 shift at the left side at the C2 to C3 level ($P=0.008$) and a lower T2 shift at the right side at the C7 to T1 level ($P=0.023$)

Perceiving pain in others: Validation of a dual processing model Pain; Volume 152 (5); May 2011, pages 1083-1089

Accurate perception of another person's painful distress would appear to be accomplished through sensitivity to both automatic (unintentional, reflexive) and controlled (intentional, purposive) behavioral expression. We examined whether observers would construe diverse behavioral cues as falling within these domains, consistent with cognitive neuroscience findings describing activation of both automatic and controlled neuroregulatory processes. Using online survey methodology, 308 research participants rated behavioral cues as "goal directed vs. non-goal directed," "conscious vs. unconscious," "uncontrolled vs. controlled," "fast vs. slow," "intentional (deliberate) vs. unintentional," "stimulus driven (obligatory) vs. self driven," and "requiring contemplation vs. not requiring contemplation." The behavioral cues were the 39 items provided by the PROMIS pain behavior bank, constructed to be representative of the diverse possibilities for pain expression. Inter-item correlations among rating scales provided evidence of sufficient internal consistency justifying a single score on an automatic/controlled dimension (excluding the inconsistent fast vs. slow scale). An initial exploratory factor analysis on 151 participant data sets yielded factors consistent with "controlled" and "automatic" actions, as well as behaviors characterized as "ambiguous." A confirmatory factor analysis using the remaining 151 data sets replicated EFA findings, supporting theoretical predictions that observers would distinguish immediate, reflexive, and spontaneous reactions (primarily facial expression and paralinguistic features of speech) from purposeful and controlled expression (verbal behavior, instrumental behavior requiring ongoing, integrated responses). There are implicit dispositions to organize cues signaling pain in others into the well-defined categories predicted by dual process theory.

Depression Is Associated With a Poorer Outcome of Lumbar Spinal Stenosis Surgery: A Two-Year Prospective Follow-up Study Spine; 15 April 2011 - Volume 36 - Issue 8 - p 677–682

Objective: To investigate the effect of depressive symptoms on the surgery outcome on 2-year follow-up among lumbar spinal stenosis (LSS) patients.

Previous research has suggested an association between preoperative depressive symptoms and a poorer surgery outcome among LSS patients. There have been no previous studies on the effect of depressive symptoms on the surgery outcome at the 2-year postoperative phase.

Methods: A total of 96 patients (mean age, 62 years) with symptomatic LSS underwent decompressive surgery. They completed the same set of questionnaires before surgery and 3 months, 6 months, 1 year, and 2 years after surgery. Depression was assessed with the 21-item Beck Depression Inventory (BDI). Physical functioning and pain were assessed with the Oswestry Disability Index, the Stucki Questionnaire, self-reported walking ability, the visual analogue scale, and pain drawing. Comparisons were made according to depression status. Logistic regression analysis was used to examine the factors associated with a poorer surgery outcome on 2-year follow-up.

Results: After surgery, the patients with continuous depression showed poorer improvement in symptom severity, the disability score, and walking capacity than the patients who did not have depression in any phase. In those patients who recovered from depression, the postoperative improvement resembled that of the constant normal mood group. In regression analyses, an independent association was detected between high preoperative BDI scores and 2-year disability and symptom severity. Strong independent associations were seen between depression burden (the sum of preoperative, 3-month and 6-month BDI scores) and 2-year disability, symptom severity, and poor walking capacity.

Conclusion: The patients with a normal mood and those who recovered from depressive symptoms enjoyed the most favorable outcome. Depressive symptoms interfere strongly with the ability of patients to obtain an optimal surgery outcome. Treatment models including the assessment and treatment of depression are encouraged.

Muscle Matters

Question: *I read with interest your article about losing weight by exercising before eating in the morning. However, I don't see why it should make a lot of difference how the weight loss is accomplished. The health benefits are the same regardless, aren't they?*

—Joseph M., Orlando, Florida

Answer: In one respect you're probably right. There are benefits to losing excess weight regardless of how it's done. However, I think it's important to keep a couple of things in mind. When the weight loss is from a loss of muscle tissue and not fat tissue, you run into problems down the road.

Years ago, there was a trend (or fad) of losing weight through low-calorie diets and aerobic exercises. That was the standard weight-loss method, and it seems to be making a comeback. Studies have shown, however, that in the long term, this may actually be making things worse. This type of exercise/weight-loss program sabotages long-term weight maintenance in two ways.

First, calorie restriction in itself has been shown to lower your basal metabolic rate (BMR) from 10% to 20%. (*Sports Med 07;37(1):31–46*)

Your BMR determines to a large extent how many calories your body burns, particularly at rest. It has been estimated that 2/3 of the calories being burned while you're at rest, or inactive, is determined by your BMR.

Second, your BMR depends on how much muscle tissue you have. Muscles are constantly in some stage of tension, which burns calories. Fat, on the other hand, does nothing and burns no calories at rest. The more muscle tissue you have, the more calories you will burn throughout the day—and at rest.

Another study had obese patients follow a low-calorie diet and either a) an aerobic exercise program (jogging, biking, walking, etc.), or b) a resistance- or weight-training program for a period of 12 weeks. At the end of the study, both groups lost weight. The aerobic group actually lost even more weight—an average of 37 pounds, while the weight-lifting group lost only 32. However, of the 37 pounds lost by the aerobic group, 10 pounds was lost muscle tissue. All of the weight lost by the weight-lifting group was fat, and there was no muscle loss. And here's the kicker. At rest, the aerobic group was burning 230 calories per day less than before completing the program, while those in the weight-lifting group were burning 63 calories more at rest than they were before their program. (*J Am Coll Nutr 99;18(2):115–121*)

This is amazing when you think about it. Even after following their program and losing weight, those in the low-calorie/ aerobic group had dropped their BMR to the point they were burning fewer calories than before. Even more aerobic exercise wouldn't make up the difference. Eventually, in these cases, the weight will start to come back in the form of fat. These studies also don't address the increased dangers associated with joint instability, frailty, osteoporosis, fractures, and falling....all related to increased muscle loss that occurs with age.

If you're going to go to the trouble of changing your diet and starting to exercise, do it in a manner that doesn't adversely affect your BMR and cause you to lose muscle tissue. Losing excess body fat is one thing. Losing muscle is quite another. ■

Three-dimensional kinematic analysis of pelvic and lower extremity differences during trunk rotation in subjects with and without chronic low back pain

Physiotherapy, 05/17/2011

Song AY et al.

Abstract

Objective

To investigate three-dimensional angular changes of the pelvis and lower extremities during trunk axial rotation in subjects with and without chronic low back pain (LBP).

Design

Repeated-measures design.

Participants

Thirty volunteers participated in the study (15 with LBP, 15 without LBP). The mean age of the subjects was 44 (standard deviation 15.8) years (range 27 to 63 years).

Main outcome measures

All participants were asked to perform five sets of axial trunk rotation activities with a bar in a standing position. The outcome measures included three-dimensional rotational angles of the pelvis and lower extremities (foot, calf and thigh).

Results

The angular change of the pelvis in the sagittal plane differed between subjects with and without LBP ($P = 0.03$). There were no significant differences in angular changes of the lower extremities in the frontal and transverse planes between groups.

Conclusions

The angular change of the pelvis in the sagittal plane differed significantly between groups. Further research is needed to investigate the three-dimensional characteristics of biomechanical and neuromuscular aspects in subjects with LBP.

Psychosocial Influences on Low Back Pain: Why Should You Care?

1. Chris J. Main and
2. Steven Z. George

June – Physical Therapy Journal[±]

Author Affiliations

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2. *S.Z. George, PT, PhD, is a **PTJ** Editorial Board member and co–editor of this special issue. He is Associate Professor and Assistant Department Chair, Department of Physical Therapy, Center for Pain Research and Behavioral Health, Brooks Center for Rehabilitation Studies, University of Florida, Gainesville, Florida.*

Because this article has no abstract, we have provided an extract of the full text and any section headings.

The purpose of this special issue of **PTJ** is to present and integrate research evidence about the influence of psychosocial factors on presentation of symptoms of pain and disability (function) in physical therapist practice. We have focused primarily on low back pain, as it is the most widely researched musculoskeletal condition. We have included a number of perspective articles, specifically elicited from established researchers, but we also have taken the opportunity to include several empirical studies that have been submitted independently to **PTJ**. These empirical studies have allowed us to illustrate (and hopefully illuminate) facets of the overall conceptual framework presented in this special issue.

As guest editors, we were at times fairly specific in the requests and recommendations we made to our colleagues, in terms of breath of topic, depth of analysis, and overall style of presentation. We attempted the difficult task of developing articles that are able ...

Recovery of Physical Functioning After Total Hip Arthroplasty: Systematic Review and Meta-Analysis of the Literature

1. Maaïke M. Vissers,
2. Johannes B. Bussmann,
3. Jan A.N. Verhaar,
4. Lidia R. Arends,
5. Andrea D. Furlan and
6. Max Reijman

Abstract

Background After total hip arthroplasty (THA), patients today (who tend to be younger and more active than those who previously underwent this surgical procedure) have high expectations regarding functional outcome. Therefore, patients need to be well informed about recovery of physical functioning after THA.

Purpose The purpose of this study was to review publications on recovery of physical functioning after THA and examine the degree of recovery with regard to 3 aspects of functioning (ie, perceived physical functioning, functional capacity to perform activities, and actual daily activity in the home situation).

Data Sources Data were obtained from the MEDLINE and EMBASE databases from inception to July 2009, and references in identified articles were tracked.

Study Selection Prospective studies with a before–after design were included. Patients included in the analysis had to have primary THA for osteoarthritis.

Data Extraction and Synthesis Two reviewers independently checked the inclusion criteria, conducted the risk of bias assessment, and extracted the results. Data were pooled in a meta-analysis using a random-effects model.

Results A total of 31 studies were included. For perceived physical functioning, patients recovered from less than 50% preoperatively to about 80% of that of controls (individuals who were healthy) 6 to 8 months postsurgery. On functional capacity, patients recovered from 70% preoperatively to about 80% of that of controls 6 to 8 months postsurgery. For actual daily activity, patients recovered from 80% preoperatively to 84% of that of controls at 6 months postsurgery.

Limitations Only a few studies were retrieved that investigated the recovery of physical functioning longer than 8 months after surgery.

Conclusions Compared with the preoperative situation, the 3 aspects of physical functioning showed varying degrees of recovery after surgery. At 6 to 8 months postoperatively, physical functioning had generally recovered to about 80% of that of controls.

This is a great series in the journal!! GJ

Impact of Psychological Factors in the Experience of Pain

1. **Steven J. Linton and**
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Abstract

This article reviews the role of psychological factors in the development of persistent pain and disability, with a focus on how basic psychological processes have been incorporated into theoretical models that have implications for physical therapy. To this end, the key psychological factors associated with the experience of pain are summarized, and an overview of how they have been integrated into the major models of pain and disability in the scientific literature is presented. Pain has clear emotional and behavioral consequences that influence the development of persistent problems and the outcome of treatment. Yet, these psychological factors are not routinely assessed in physical therapy clinics, nor are they sufficiently utilized to enhance treatment. Based on a review of the scientific evidence, a set of 10 principles that have likely implications for clinical practice is offered. Because psychological processes have an influence on both the experience of pain and the treatment outcome, the integration of psychological principles into physical therapy treatment would seem to have potential to enhance outcomes.

Psychosocial Influences on Low Back Pain, Disability, and Response to Treatment

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Abstract

Evidence suggests that psychosocial factors have an influence on the outcome of physical therapy treatment and that the extent of their influence differs considerably among patients. As a consequence, substantial research efforts are focused on developing new clinical tools designed to identify and highlight when psychosocial factors are present at a level relevant to decision making. The conceptual differences in the ways that psychosocial factors influence outcome are described, structured around 3 common research terms: (1) prognostic factors, (2) treatment effect modifiers or moderators, and (3) treatment mediators. Prognostic factors are those characteristics that help estimate a patient's likely outcome irrespective of the chosen management. Treatment effect modifiers or moderators are factors measured at baseline that influence the relationship between a specific intervention and outcome. Treatment mediators are factors that have an intermediary role in the link between treatment and outcome. How these different influences on outcome can be translated into useful and complementary tools that aim to reduce treatment variability in clinical practice is described. One approach is to use prognostic factors to develop screening tools that identify an individual's risk status, typically based on predictive psychosocial factors such as catastrophizing and depression. Another approach is to identify specific treatment effect modifiers to derive treatment decision aids or prediction rules to help match a patient's characteristics to the interventions available. A third approach is to use treatment mediators (eg, self-efficacy) to develop monitoring tools to inform the clinician about which aspects of treatment to strengthen.

Early Identification and Management of Psychological Risk Factors (“Yellow Flags”) in Patients With Low Back Pain: A Reappraisal

1. Michael K. Nicholas,
2. Steven J. Linton,
3. Paul J. Watson,
4. Chris J. Main and
5. the “Decade of the Flags” Working Group

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Abstract

Originally the term “yellow flags” was used to describe psychosocial prognostic factors for the development of disability following the onset of musculoskeletal pain. The identification of yellow flags through early screening was expected to prompt the application of intervention guidelines to achieve secondary prevention. In recent conceptualizations of yellow flags, it has been suggested that their range of applicability should be confined primarily to psychological risk factors to differentiate them from other risk factors, such as social and environmental variables. This article addresses 2 specific questions that arise from this development: (1) Can yellow flags influence outcomes in people with acute or subacute low back pain? and (2) Can yellow flags be targeted in interventions to produce better outcomes? Consistent evidence has been found to support the role of various psychological factors in prognosis, although questions remain about which factors are the most important, both individually and in combination, and how they affect outcomes. Published early interventions have reported mixed results, but, overall, the evidence suggests that targeting yellow flags, particularly when they are at high levels, does seem to lead to more consistently positive results than either ignoring them or providing omnibus interventions to people regardless of psychological risk factors. Psychological risk factors for poor prognosis can be identified clinically and addressed within interventions, but questions remain in relation to issues such as timing, necessary skills, content of treatments, and context. In addition, there is still a need to elucidate mechanisms of change and better integrate this understanding into the broader context of secondary prevention of chronic pain and disability.

Relationship Among Pain Catastrophizing, Depressed Mood, and Outcomes Across Physical Therapy Treatments

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2. Katja Boersma,
3. Thomas Overmeer and

1. Steven J. Linton

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Background Pain catastrophizing and emotional distress can act as prognostic factors for pain and disability. Research on how these variables interact within individuals and over time is in an early stage. Understanding various patterns of prognostic factors and how these factors change during treatment is important for developing treatments targeting important factors.

Objective The primary aim of this study was to investigate relationships between pain catastrophizing and depressed mood in people seeking primary care for musculoskeletal pain. An additional aim was to relate these patterns of prognostic factors to outcomes during a 6-month period.

Design The design was prospective; data were obtained at baseline and at follow-up.

Methods Forty-two physical therapists taking part in an educational program recruited, from their clinical practices in primary care, consecutive patients who were currently experiencing a pain problem. Patients received various physical therapy interventions between baseline and follow-up.

Results On the basis of patterns of scoring for pain catastrophizing and depressed mood, 4 subgroups of participants were found. Belonging to a subgroup with elevated levels of either pain catastrophizing or depressed mood at baseline was related to the absence of improvement and elevated levels of disability after physical therapy interventions. Furthermore, elevated levels of both variables were related to the highest levels of disability.

Limitations The analyses relied on self-report. Neither treatment content nor pain-related fear was measured. The sample was a mixture of participants reporting acute pain and subacute pain.

Conclusions The results stress the importance of assessing and targeting prognostic factors. Moreover, the results suggest the need to tailor treatments to match patterns of prognostic factors and the need to target depressed mood and pain catastrophizing in physical therapy interventions.

Psychologically Informed Interventions for Low Back Pain: An Update for Physical Therapists

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Abstract

A central theme of current evidence-based guidelines for managing low back pain is endorsement of the resumption of activities despite the presence of pain. This task can be challenging for both therapists and patients, and there are many essentially psychological obstacles to implementing the guidelines. These obstacles can be overcome by knowing how to recognize potential psychological obstacles and understanding the options for managing psychological obstacles in combination with activity-based interventions. This article is intended to address these tasks by explaining and describing the application of empirically based psychological principles and strategic clinical reasoning. Importantly, the roles of skills in assessment, treatment planning, and communication with patients are identified as essential but feasible skills for physical therapists to acquire with appropriate training.

Addressing Occupational Factors in the Management of Low Back Pain: Implications for Physical Therapist Practice

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Abstract

There is mounting evidence that occupational factors influence the extent of sickness absence following an episode of low back pain, but there have been limited efforts to integrate the identification and management of occupational factors into the routine practice of physical therapists. Systematic reviews suggest that a client's report of heavy physical demands, inability to modify job tasks, work stress, lack of organizational support, job dissatisfaction, poor expectations for resuming usual work, and fear of reinjury are indications of significant barriers to returning to work. Recommended strategies for evaluating and addressing occupational factors are explored with respect to the physical therapist's role in client assessment, development of activity and lifestyle recommendations, therapeutic exercise, communication with other providers, and summary reports. Primary recommendations include: (1) administration of self-report questionnaires to assess a client's perspective of physical job demands, (2) client-centered interviewing to highlight individual return-to-work concerns, (3) early discussions with clients about possible job modifications, and (4) incorporation of clients' workplace concerns in progress reports and summaries. These strategies may improve low back pain outcomes by encouraging effective communication with key stakeholders and by developing clients' ability to resolve obstacles to returning to work.

Does Teaching Physical Therapists to Deliver a Biopsychosocial Treatment Program Result in Better Patient Outcomes? A Randomized Controlled Trial

Thomas Overmeer, Katja Boersma, Eva Denison and Steven J. Linton Background Psychosocial prognostic factors are important in the development of chronic pain, but treatment providers often lack knowledge and skills to assess and address these risk factors.

Objective The aim of this study was to examine the effects on outcomes (pain and disability) in patients of a course about psychosocial prognostic factors for physical therapists.

Design This study was a randomized, controlled trial.

Setting The setting was primary care practice.

Participants Forty-two primary care physical therapists attended an 8-day university course (over 8 weeks) aimed at identifying and addressing psychosocial risk factors.

Intervention The physical therapists were randomly assigned to either the course or a waiting list. They treated consecutive patients with acute and subacute musculoskeletal pain both before and after the course. **Measurements** We measured physical therapists' attitudes and beliefs about psychosocial factors, knowledge, and skills before and after the course. We measured patients' pain, disability, catastrophizing, and mood at the start of treatment and at a 6-month follow-up.

Methods The physical therapists were randomly assigned to either the course or a waiting list. They treated consecutive patients with acute and subacute musculoskeletal pain both before and after the course.

Results Pain and disability outcomes in all patients of physical therapists who had participated in the course or in patients at risk of developing long-term disability who had higher levels of catastrophizing or depression were not significantly different from those outcomes in patients of physical therapists who had not participated in the course. Pain and disability outcomes in patients with a low risk of developing long-term disability—and pain outcomes in patients with a high risk of developing long-term disability—were not dependent upon whether the attitudes and beliefs of their physical therapists changed during the course. However, disability outcomes in patients with a high risk of developing long-term disability may have been influenced by whether the attitudes and beliefs of their physical therapists changed. **Limitations** A limitation of this study was that actual practice behavior was not measured.

Conclusions An 8-day university course for physical therapists did not improve outcomes in a group of patients as a whole or in patients with a risk of developing long-term disability. However, patients who had a risk of developing long-term disability and had higher levels of catastrophizing or

depression may have shown greater reductions in disability if the attitudes and beliefs of their physical therapists changed during the course.

PT Journal June 2011-05-17

Psychologically Informed Practice for Management of Low Back Pain: Future Directions in Practice and Research

1. Chris J. Main and
2. Steven Z. George

Abstract

In this perspective article, a number of conclusions and recommendations are offered based on the articles in this special issue of **PTJ**. In this special issue, a new approach to physical therapy, termed “psychologically informed practice,” is offered as a “middle way” between narrowly focused standard physical therapist practice based on biomedical principles and the more cognitive-behavioral approaches developed originally for the treatment of mental illness. This new approach uses the “flags” framework, with psychologically informed practice requiring routine and specific consideration of “yellow flags” and “blue flags” (depending on clinical setting) for determining risk of poor outcome and identifying the potential for treatment modification—but with cognizance of the overall environment or context in which the clinician must operate. This context includes professional culture, health care policy, and insurance reimbursement (potential “black flags”). The primary goal of this approach is to prevent the development of unnecessary pain-associated activity limitations. The approach is based on the identification of normal psychological processes that affect the perception of pain and the response to it as an expected and normal part of the musculoskeletal pain experience and that are potentially modifiable. The potential for linking risk identification with targeted treatment has been discussed, this article focuses on the potential implications for training and implementation, drawing on experience in developing training programs in which the trainees have welcomed this new approach, viewing it as a helpful extension of their basic professional training. Indeed, this new approach can be viewed as evolutionary rather than revolutionary, in that it builds upon the established professional expertise of physical therapists, but incorporates systematic attention to the psychosocial factors that are associated with outcome of treatment.

Prospective case series of litigants and non-litigants with chronic spinal pain treated with dextrose prolotherapy

International Musculoskeletal Medicine, 05/23/2011

Hooper RA et al.

Abstract:

Objectives

To compare outcomes for litigants and non-litigants with chronic spinal pain treated with dextrose prolotherapy.

Methods

One hundred and forty-seven consecutive patients with chronic spinal pain were classified as litigants if they had retained a lawyer for an unresolved claim at the start of treatment, or as non-litigants if they had previously settled claims or sustained non-compensable injuries. Patients were treated with a solution of 20% dextrose and 0.75% lidocaine. One-half milliliter of proliferant was injected into facet capsules of the cervical, thoracic, or lumbar spine. The iliolumbar and dorsal sacroiliac ligaments were also injected for a total of 10 cc in low back pain patients. The Neck Disability Index, Patient Specific Functional Scale, and Roland-Morris Disability Questionnaire scales were administered before treatment and approximately 1 year after treatment. At the 1-year follow-up, patients were also asked to rate their change in symptoms, function, ability to work, willingness to repeat treatment, and need for ongoing medications or other treatment.

Results

Both litigants (71) and non-litigants (76) showed significant improvement from baseline on all disability scales ($P < 0.001$). There were no differences in the percentage of litigants/non-litigants reporting improvement on impression of change scales for symptoms (91/92%), function (90/90%), improved ability to work (76/75%), willingness to repeat treatment (91/93%), ability to decrease medication (82/81%), and decreased need for other treatment (80/84%).

Discussion

Litigants and non-litigants with chronic spinal pain treated with prolotherapy showed statistically and clinically significant improvements in measures of disability, and impression of change scales. Litigation need not be an exclusion factor for future spine prolotherapy studies.

Prevalence of joint-related pain in the extremities and spine in five groups of top athletes

Knee Surgery, Sports Traumatology, Arthroscopy, 05/24/2011

Jonasson P et al.

Purpose

Joint-related pain conditions from the spine and extremities are common among top athletes. The frequency of back pain has, however, been studied in more detail, and the frequency of low-back pain in top athletes in different high-load sports has been reported to be as high as 85%. Sport-related pain from different joints in the extremities is, however, infrequently reported on in the literature.

Methods

Seventy-five male athletes, i.e. divers, weight-lifters, wrestlers, orienteers and ice-hockey players and 12 non-athletes (control group) were included in the study. A specific self-assessed pain-oriented questionnaire related to the cervical, thoracic and lumbar spine, as well as the various joints, i.e. shoulders, elbows, wrists, hips, knees and ankles, was filled out by the athletes and the non-athletes.

Results

The overall frequency of pain reported by the athletes during the last week/last year was as follows; cervical spine 35/55%; thoracic spine 22/33%; lumbar spine 50/68%; shoulder 10/21%; elbow 7/7%; wrist 7/8%; hip 15/23%; knee 22/44%; and ankle 11/25%. The corresponding values for non-athletes were cervical spine 9/36%; thoracic spine 17/33%; lumbar spine 36/50%; shoulder 0/9%; elbow 9/0%; wrist 0/0%; hip 9/16%; knee 10/9%; and ankle 0/0%. A higher percentage of athletes reported pain in almost all joint regions, but there were no statistically significant differences (n.s.), with the exception of the knees ($P = 0.05$).

Over the last year, athletes reporting the highest pain frequency in the lumbar spine were ice-hockey players and, in the cervical spine, wrestlers and ice-hockey players. The highest levels of knee pain were found among wrestlers and ice-hockey players, whereas the highest levels for wrist pain were found among divers, hip pain among weight-lifters, orienteers and divers and ankle pain among orienteers. For the thoracic spine, shoulder and elbow regions, only minor differences were found.

Conclusion

There was no statistically significant difference in prevalence of pain in the neck, spine and joints between top athletes in different sports or between athletes and non-athletes. However, pain in one spinal region was correlated to reported pain in other regions of the spine. Moreover, pain in the spine was also correlated to pain in the shoulders, hips and knees.

Mid-portion Achilles tendinopathy: why painful? An evidence-based philosophy

Knee Surgery, Sports Traumatology, Arthroscopy, 05/24/2011

Van Sterkenburg MN et al.

Abstract

Chronic mid-portion Achilles tendinopathy is generally difficult to treat as the background to the pain mechanisms has not yet been clarified. A wide range of conservative and surgical treatment options are available. Most address intratendinous degenerative changes when present, as it is believed that these changes are responsible for the symptoms. Since up to 34% of asymptomatic tendons show histopathological changes, we believe that the tendon proper is not the cause of pain in the majority of patients. Chronic painful tendons show the ingrowth of sensory and sympathetic nerves from the paratenon with release of nociceptive substances. Denervating the Achilles tendon by release of the paratenon is sufficient to cause pain relief in the majority of patients. This type of treatment has the additional advantage that it is associated with a shorter recovery time when compared with treatment options that address the tendon itself. An evidence-based philosophy on the cause of pain in chronic mid-portion Achilles tendinopathy is presented.

Level of evidence V.

Management of vestibular migraine

Therapeutic Advances in Neurological Disorders, 05/23/2011 **Clinical Article**

Bisdorff AR et al.

Abstract

Vestibular migraine is considered to be the second most common cause of vertigo and the most common cause of spontaneous episodic vertigo. The duration of attacks varies from seconds to days, usually lasting minutes to hours, and they mostly occur independently of headaches. Long-lasting individual attacks are treated with generic antivertiginous and antiemetic drugs. Specific antimigraine drugs are unlikely to be very effective for rescue. The mainstay of the management of vestibular migraine is prophylactic medication. To date, there are no controlled trials available; the body of knowledge builds on case series and retrospective or observational studies. Most drugs are also used for the prevention of migraine headaches. The choice of medication should be guided by its side effect profile and the comorbidities of patients. Betablockers such as propranolol or metoprolol are preferred in patients with hypertension but in the absence of asthma. Anticonvulsants include topiramate when patients are obese, valproic acid and lamotrigine. Lamotrigine is preferred if vertigo is more frequent than headaches. Calcium antagonists include verapamil and flunarizine. If patients have anxiety, tricyclic antidepressants such as amitriptyline or nortriptyline or SSRIs and benzodiazepines such as clonazepam are recommended. Acetazolamide is effective in rare genetic disorders related to migraine-like episodic ataxia; however, its place in vestibular migraine is still to be established. Nonpharmacological measures such as diet, sleep, hygiene and avoidance of triggers are recommended as they are for migraine. Vestibular rehabilitation might be useful when there are complications such as loss of confidence in balance or visual dependence.

Ankle positioning and knee perturbation affect temporal recruitment of the vasti muscles in people with patellofemoral pain.[Ng EC](#), [Chui MP](#), [Siu AY](#), [Yam VW](#), [Ng GY](#)

20110397(1):65-70Language: engCountry: EnglandDepartment of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hung Hom, Hong Kong.

OBJECTIVES: To compare the temporal recruitment of the vastus medialis obliquus (VMO) and vastus lateralis (VL) during voluntary ankle movements and perturbed standing in people with patellofemoral pain, and to determine the effects of different reflex and voluntary postural exercise tasks on VMO facilitation.

DESIGN: Repeated-measures design.

PARTICIPANTS: Twenty-three subjects with patellofemoral pain.

INTERVENTIONS: Quadriceps reflex contraction in response to postero-anterior knee perturbations was measured with three crural muscle contraction conditions and three postural exercises (semi-squatting, tip-toeing and heel standing).

MAIN OUTCOME MEASURES: The electromyographic (EMG) onset time of the VMO and VL during each task was measured and compared across the different tasks.

RESULTS: The mean EMG onset time of the VMO was later than that of the VL in the voluntary tasks such as tip-toeing (VMO 95.3ms vs VL 36.4ms, mean difference 58.9ms, 95% confidence interval -33.7 to 151.5ms), whereas earlier VMO activation was found in the perturbation tests such as toe standing (VMO 17.6ms vs VL 22.9ms, mean difference -5.3ms, 95% confidence interval -25.3 to 14.7ms).

CONCLUSION: These findings suggest the potential benefits of unexpected perturbation activities for facilitating VMO activation. The clinical applications of perturbation tasks in rehabilitation exercise programmes and the underlying mechanisms warrant further investigation.

Spinal Manipulative Therapy for Chronic Low-Back Pain: An Update of a Cochrane Review

Spine, 05/27/2011

Rubinstein SM et al. – High-quality evidence suggests that there is no clinically relevant difference between SMT and other interventions for reducing pain and improving function in patients with chronic low-back pain. Determining cost-effectiveness of care has high priority.

Methods

- An experienced librarian searched for randomized controlled trials (RCTs) in multiple databases up to June 2009.
- RCTs that examined manipulation or mobilization in adults with chronic low-back pain were included.
- The primary outcomes were pain, functional status, and perceived recovery.
- Secondary outcomes were return-to-work and quality of life. Data collection and analysis.
- Two authors independently conducted the study selection, risk of bias assessment, and data extraction.
- GRADE was used to assess the quality of the evidence.

Results

- Authors included 26 RCTs (total participants = 6070), 9 of which had a low risk of bias.
- Approximately two-thirds of the included studies (N = 18) were not evaluated in the previous review.
- There is a high-quality evidence that SMT has a small, significant, but not clinically relevant, short-term effect on pain relief (mean difference -4.16, 95% confidence interval -6.97 to -1.36) and functional status (standardized mean difference -0.22, 95% confidence interval -0.36 to -0.07) in comparison with other interventions.
- There is varying quality of evidence that SMT has a significant short-term effect on pain relief and functional status when added to another intervention.
- There is a very low-quality evidence that SMT is not more effective than inert interventions or sham SMT for short-term pain relief or functional status.
- Data were particularly sparse for recovery, return-to-work, quality of life, and costs of care.
- No serious complications were observed with SMT.

Kinesio Taping applied to lumbar muscles influences clinical and electromyographic characteristics in chronic low back pain patients

European Journal of Physical and Rehabilitation Medicine, 05/27/2011

Paoloni M et al. – When applied to chronic low back pain (CLBP) patients, Kinesio Taping (KT) leads to pain relief and lumbar muscle function normalization shortly after its application; these effects persist over a short follow-up period.

Methods

- KT plus exercise, KT alone or exercise alone have been used for four weeks.
- Pain, disability and lumbar muscle function were evaluated before and after the treatment period.

Results

- The patients in all three groups displayed a significant reduction in pain after treatment, though only the exercise-alone group displayed reduced disability.
- A return to normal lumbar muscle function was observed in 28% of patients, but was not related to a reduction in pain.

- **BACKGROUND:** Kinesio Taping (KT) has proved to be effective in various musculoskeletal conditions. Although its precise working mechanism has yet to be fully understood, it is believed to interact with neuromuscular function through mechanoreceptor activation. No studies designed to assess the effects of KT in chronic low back pain (CLBP) patients have yet been conducted.

AIM: The aim of this study was to determine the effects of KT on pain, disability and lumbar muscle function in sufferers of CLBP, both immediately and at a one-month follow-up examination.

DESIGN: The study consisted of two phases: phase I was based on an intra-subject pre-test/post-test procedure; phase II was based on a randomized, single-blinded controlled trial.

SETTING: Outpatient facility.

POPULATION: Thirty-nine CLBP patients were enrolled.

METHODS: KT plus exercise, KT alone or exercise alone have been used for four weeks. Pain, disability and lumbar muscle function were evaluated before and after the treatment period.

RESULTS; The patients in all three groups displayed a significant reduction in pain after treatment, though only the exercise-alone group displayed reduced disability. A return to normal lumbar muscle function was observed in 28% of patients, but was not related to a reduction in pain.

CONCLUSION: When applied to CLBP patients, KT leads to pain relief and lumbar muscle function normalization shortly after its application; these effects persist over a short follow-up period.

CLINICAL REHABILITATION IMPACT: KT may represent an effective adjunct therapy in the physical rehabilitation program of CLBP patients for immediate and acute pain control.

- *language: English*

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Education: Review Articles

Smoking and Pain: Pathophysiology and Clinical Implications

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ABSTRACT

Cigarette smoke, which serves as a nicotine delivery vehicle in humans, produces profound changes in physiology. Experimental studies suggest that nicotine has analgesic properties. However, epidemiologic evidence shows that smoking is a risk factor for chronic pain. The complex relationship between smoking and pain not only is of scientific interest, but also has clinical relevance in the practice of anesthesiology and pain medicine. This review will examine current knowledge regarding how acute and chronic exposure to nicotine and cigarette smoke affects acute and chronic painful conditions. It will cover the relevant pharmacology of nicotine and other ligands at the nicotinic acetylcholine receptor as related to pain, explore the association of cigarette smoking with chronic painful conditions and potential mechanisms to explain this association, and examine clinical implications for the care of smokers with pain.