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LBP**Twin study and LBP**

Eur J Pain. 2014 Nov;18(10):1410-8. doi: 10.1002/ejp.506. Epub 2014 Apr 15.

Heritability and lifestyle factors in chronic low back pain: Results of the Australian Twin Low Back Pain Study (The AUTBACK study).

Junqueira DR¹, Ferreira ML, Refshauge K, Maher CG, Hopper JL, Hancock M, Carvalho MG, Ferreira PH.

Author information**Abstract****BACKGROUND:**

Heritability and population-specific lifestyle factors are considered to significantly contribute to chronic low back pain (LBP), but traditional population studies fail to (1) adjust for genetics; and (2) use standard and validated definitions for LBP and for lifestyle factors.

METHODS:

Using a classical and a co-twin control study design and validated definitions for chronic LBP and lifestyle variables, we explored the relative contribution of genetics and environment on the prevalence of chronic LBP in a sample of adult Australian twins.

RESULTS:

Data from 105 twin pairs showed that the prevalence of chronic LBP is significantly determined by genetic factors (heritability = 32%). Additionally, monozygotic twins were five times more likely to have chronic LBP than dizygotic twins when one of the siblings of the pair was affected. In a case-control analysis (n = 38 twin pairs), an exploratory analysis showed higher prevalence of chronic LBP associated with light walking exercises and vigorous gardening or heavy work around the house. Daily time spent in sitting was also positively associated with chronic LBP, but not moderate physical activities such as jogging, cycling and gentle swimming. In the final multivariate model, only time spent in vigorous gardening or heavy work around the house remained associated with chronic LBP (odds ratio 6.5; 95% confidence interval 1.47-28.8).

CONCLUSIONS:

The type, frequency and duration of physical activity may be important to understand risk factors for chronic LBP. The causation path between chronic LBP and people's engagement in activities involving frequent bending and twisting such as gardening and housework should be further investigated.

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PMID: 24733726

Cold hyperalgesia

Clin J Pain. 2014 Oct;30(10):886-93. doi: 10.1097/AJP.0000000000000045.

Contributions of mood, pain catastrophizing, and cold hyperalgesia in acute and chronic low back pain: a comparison with pain-free controls.

Hübscher M¹, Moloney N, Rebbeck T, Traeger A, Refshauge KM.

Abstract**OBJECTIVES:**

Quantitative sensory testing (QST) has been used to elucidate the peripheral and central mechanisms that underlie changes in pain sensitivity associated with low back pain (LBP). However, it remains unclear to what degree peripheral and central changes contribute to the generation and maintenance of LBP. The aim of this study was to compare thermal pain sensitivity, measured using QST, in participants with acute LBP, chronic LBP, and pain-free controls.

MATERIALS AND METHODS:

Participant groups with acute LBP (N=20), chronic LBP (N=30), and pain-free controls (N=30) were assessed by thermal QST. The unique contributions of pain-related psychological and QST variables to predict membership to the acute and chronic pain groups were also determined.

RESULTS:

We found that participants with chronic LBP demonstrated significantly lower cold pain threshold (CPT) in the primary area of pain (low back) as well as in an area anatomically remote from the primary area of pain (forearm) when compared with controls. Participants with acute LBP did not show significantly elevated pain sensitivity. CPT at the remote site was a significant independent predictor of membership to the chronic pain group, after the adjustment for mood and pain catastrophizing. CPT explained 8% of the total variance of 46% related to group membership.

DISCUSSION:

We found evidence for localized and generalized cold hyperalgesia in chronic, but not acute LBP. We might speculate that hyperalgesia develops as a consequence of long-lasting LBP, but prospective studies are needed to confirm this assumption.

PMID: 24145929

LBP subgroups

Clin J Pain. 2014 Dec;30(12):1023-32. doi: 10.1097/AJP.0000000000000080.

Low back pain patient subgroups in primary care: pain characteristics, psychosocial determinants, and health care utilization.

Hirsch O¹, Strauch K, Held H, Redaelli M, Chenot JF, Leonhardt C, Keller S, Baum E, Pfingsten M, Hildebrandt J, Basler HD, Kochen MM, Donner-Banzhoff N, Becker A.

Abstract**OBJECTIVES:**

In industrialized countries, low back pain (LBP) is one of the leading causes for prolonged sick leave, early retirement, and high health care costs. Providing the same treatments to all patients is neither effective nor feasible, and may impede patients' recovery. Recent studies have outlined the need for subgroup-specific treatment allocation.

METHODS:

This is a cross-sectional study that used baseline data from consecutively recruited patients participating in a guideline implementation trial regarding LBP in primary care. Classification variables were employment status, age, pain intensity, functional capacity (HFAQ), depression (CES-D), belief that activity causes pain (FABQ subscale), 2 scales of the SF-36 (general health, vitality), and days in pain per year. We performed k-means cluster analyses and split-half cross-validation. Subsequently, we investigated whether the resulting groups incurred different direct and indirect costs during a 6-month period before the index consultation.

RESULTS:

A 4-cluster solution showed good statistical quality criteria, even after split-half cross-validation. "Elderly patients adapted to pain" (cluster 1) and "younger patients with acute pain" (cluster 4) accounted for 55% of all patients. Cluster validation showed the lowest direct and indirect costs in these groups. About 72% of total costs per patient referred to clusters 2 and 3 ("patients with chronic severe pain with comorbid depression" and "younger patients with subacute pain and emotional distress").

DISCUSSION:

Our study adds substantially to the knowledge of LBP-related case-mix in primary care. Information on differential health care needs may be inferred from our study, enabling decision makers to allocate resources more appropriately and to reduce costs.

PMID: 24480909

Guilt and LBP

Clin J Pain. 2014 Dec;30(12):1062-9. doi: 10.1097/AJP.0000000000000059.

Pain-related Guilt in Low Back Pain.

Serbic D¹, Pincus T.

Abstract**OBJECTIVES:**

Identifying mechanisms that mediate recovery is imperative to improve outcomes in low back pain (LBP). Qualitative studies suggest that guilt may be such a mechanism, but research on this concept is scarce, and reliable instruments to measure pain-related guilt are not available.

METHODS:

We addressed this gap by developing and testing a Pain-related Guilt Scale (PGS) for people with LBP. Two samples of participants with LBP completed the scale and provided data on rates of depression, anxiety, pain intensity, and disability.

RESULTS:

Three factors were identified using exploratory factor analysis (n=137): "Social guilt," (4 items) relating to letting down family and friends; "Managing condition/pain guilt," (5 items) relating to failing to overcome and control pain; and "Verification of pain guilt," (3 items) relating to the absence of objective evidence and diagnosis. This factor structure was confirmed using confirmatory factor analysis (n=288), demonstrating an adequate to good fit with the data (AGFI=0.913, RMSEA=0.061). The PGS subscales positively correlated with depression, anxiety, pain intensity, and disability. After controlling for depression and anxiety the majority of relationships between the PGS subscales and disability and pain intensity remained significant, suggesting that guilt shared unique variance with disability and pain intensity independent of depression and anxiety. High levels of guilt were reported by over 40% of participants.

DISCUSSION:

The findings suggest that pain-related guilt is common and is associated with clinical outcomes. Prospective research is needed to examine the role of guilt as a predictor, moderator, and mediator of patients' outcomes.

PMID: 25329140

INJECTIONS

Epidurals in radicular symptoms

Epidural steroids for lumbosacral radicular syndrome compared to usual care: Quality of life and cost-utility in general practice

Archives of Physical Medicine and Rehabilitation, 11/11/2014 Clinical Article

Spijker-Huiges A, et al. –

Abstract

Objective

To investigate the effect of adding segmental epidural steroid injections (SESIs) to the usual care compared to usual care alone on quality of life and cost-utility in lumbosacral radicular syndrome (LRS) in general practice.

Design

A pragmatic randomized controlled trial. Results were analyzed using mixed models.

Setting

Primary care.

Participants

Patients in the acute phase of lumbosacral radicular syndrome, n = 50.

Interventions

One epidural injection containing 80 mgs of triamcinolone in normal saline.

Main outcome measure

Back pain at four weeks after the start of the treatment.

Results

Both groups experienced significant increase in quality of life in (especially) the physical domains of the SF-36. The intervention group scored significantly better than the control group at certain time points in the physical domain. The differences were small. The cost-utility analysis showed that with a negligible loss of utility (3 days in perfect health) societal costs (€193.354,- per QALY lost) would be saved, due to more productivity in the intervention group.

Conclusions

Although the beneficial effects of SESIs are small and the natural course of LRS is predominantly favourable, we think decision makers can consider implementing SESIs in daily practice with the purpose of saving resources. Caution must be taken, and further research should be directed at identifying patient subgroups who might benefit from SESIs, with additional focus on (costs of) complications and side effects.

PELVIC GIRDLE

Si DJ and symptoms

The Prevalence of Sacroiliac Joint Degeneration in Asymptomatic Adults: A Review of 500 CT Scans Proceedings of the NASS 29th Annual Meeting / The Spine Journal 14 (2014) 1S–183S

BACKGROUND CONTEXT: Degenerative changes of the sacroiliac (SI) joint have been implicated as a cause of lower back pain in adults, and there is increasing interest in invasive treatments ranging from SI joint injection to fusion.

PURPOSE: The purpose of the study was to determine prevalence of SI joint degeneration in asymptomatic patient.

STUDY DESIGN/SETTING: Retrospective cohort at an academic institution.

PATIENT SAMPLE: Five hundred patients who underwent abdomen/pelvis CT scans obtained for reasons other than low back or pelvic girdle pain were identified. Three hundred seventy-three patients were included in the study after secondary chart review (exclusion criteria characterized below).

OUTCOME MEASURES: Degree of degenerative SI joint changes in each SI joint as characterized below.

METHODS: Five hundred abdomen/ pelvis axial CT scans obtained for reasons other than low back or pelvic girdle pain were identified. Patients were excluded if CT indication included trauma, the presence of open physes, or the presence of hip or spinal instrumentation. A secondary comprehensive chart review was performed; patients with a history of lumbar stenosis; low back, pelvic, or hip pain; previous lumbar, pelvic or hip surgery; or history of metastatic, inflammatory or rheumatologic disease were excluded. All CTs were reviewed by

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a fellowship trained orthopedic traumatologist and a current orthopedic trauma fellow. Left and right SI joints were characterized as Type 0 if no degenerative changes were present, Type 1 in the presence of minimal degenerative changes, Type 2 in the setting of significant degenerative changes without ankylosis and Type 3 in the setting of SI joint ankylosis.

RESULTS: A total of 746 SI joints in 373 patients met inclusion criteria. Mean age was 57 years old (192 male and 181 females). Overall prevalence of degeneration in at least one SI joint was 131 (35%) and overall prevalence of significant change (type 2 or 3) in at least one SI joint was 114 (30%). Prevalence of some or significant change in at least 1 SI joint increased with each decade of life from 16% and 0%, respectively, in the second decade to 90% and 43% in the 8th decade of life.

CONCLUSIONS: Degenerative changes of the SI joints are prevalent in an asymptomatic patient population and are increasingly common with increasing age. Understanding the natural history of the SI joint as determined by CT scan is important for developing appropriate treatment strategies for patients with both traumatic and degenerative conditions of the SI joint. This includes patients with SI joint injuries treated nonoperatively or with SI screws as well as patients with low back pain and SI joint degeneration on axial imaging who are being evaluated for fusion. The treating surgeon must be cautious in attributing low back pain to CT evidence of trauma, degeneration or penetration of the joint by screws. Diagnostic tests to distinguish SI joint pain from other sources of back pain merit additional research.

VISCERA**IBS costs**

Aliment Pharmacol Ther. 2003 Oct 1;18(7):671-82.

Systematic review: the economic impact of irritable bowel syndrome.

Inadomi JM¹, Fennerty MB, Bjorkman D.

Abstract**BACKGROUND:**

Although little mortality is associated with irritable bowel syndrome, curative therapy does not exist and thus the economic impact of this disorder may be considerable.

METHODS:

A systematic review of the literature was performed. Studies were included if their focus was irritable bowel syndrome, and direct and/or productivity (indirect) costs were reported. Two investigators abstracted the data independently.

RESULTS:

One hundred and seventy-four studies were retrieved by the search; 11 fulfilled all criteria for entry into the review. The mean direct costs of irritable bowel syndrome management were reported to be UK pound sterling90, Canadian\$259 and US\$619 per patient annually, with total annual direct costs related to irritable bowel syndrome of pound sterling45.6 million (UK) and \$1.35 billion (USA). Direct resource consumption of all health care for irritable bowel syndrome patients ranged from US\$742 to US\$3166. Productivity costs ranged from US\$335 to US\$748, with total annual costs of \$205 million estimated in the USA. Annual expenditure for all health care, in addition to expenditure limited to gastrointestinal disorders, was significantly higher in irritable bowel syndrome patients than in control populations.

CONCLUSIONS:

Despite the lack of significant mortality, irritable bowel syndrome is associated with high direct and productivity costs. Irritable bowel syndrome patients consume more gastrointestinal-related and more total health care resources than non-irritable bowel syndrome controls, and sustain significantly greater productivity losses.

PMID:14510740

Pelvic floor and bladder

Int Urogynecol J. 2014 Sep 30.

Short-term effect of adding pelvic floor muscle training to bladder training for female urinary incontinence: a randomized controlled trial.

Kaya S¹, Akbayrak T, Gursen C, Beksac S.

Abstract

INTRODUCTION AND HYPOTHESIS:

The aim of this study was to assess whether bladder training (BT) combined with high-intensity pelvic floor muscle training (BT + PFMT) results in better outcomes in the short term than BT alone on female urinary incontinence (UI).

METHODS:

We randomly assigned 108 women with diagnoses of stress UI (SUI, n = 50), urgency UI (UUI, n = 16), or mixed UI (MUI, n = 42) to 6 weeks of BT + PFMT or BT alone (control group). The primary outcome measure was self-reported improvement. Secondary outcome measures were UI severity, symptom distress, quality of life (QOL), mean number of UI episodes and micturitions per day, and pelvic floor muscle strength and endurance (PFME).

RESULTS:

Overall and in the SUI and MUI subgroups, significantly more patients in the BT + PFMT group reported cured and improved symptoms. Overall and in SUI patients, the BT + PFMT group also improved to significantly greater degree in UI severity, symptom distress, QOL, daily UI episodes, and PFME. The only parameter showing more improvement in patients with UUI was QOL, and UI severity in patients with MUI ($p < 0.05$). There were no other significant differences between the two study groups in overall and subgroup analysis ($p > 0.05$).

CONCLUSIONS:

High-intensity PFMT combined with BT is more effective than BT alone in the short term for treating UI or SUI. It appears that the combination therapy may also lead to greater benefits for patients with UUI and MUI. Based on the results of this study, further studies with larger sample sizes (for UUI) and long-term follow-ups are warranted.

PMID: 25266357

Probiotics and constipation

J Gastroenterol Hepatol. 2013 Jul;28(7):1141-7. doi: 10.1111/jgh.12168.

Effects of a probiotic fermented milk on functional constipation: a randomized, double-blind, placebo-controlled study.

Mazlyn MM¹, Nagarajah LH, Fatimah A, Norimah AK, Goh KL.

- J Gastroenterol Hepatol. 2013 Sep;28(9):1584.

Abstract

BACKGROUND AND AIM:

Evidence suggests that probiotics reduce certain constipation-related symptoms. *Lactobacillus casei* strain Shirota has never been tested as treatment for functional constipation in otherwise-healthy subjects. To evaluate the efficacy of this probiotic among adults with functional constipation was aimed.

METHODS:

Subjects with functional constipation (Rome II-defined) were randomized to intake *L. casei* strain Shirota fermented milk or placebo once daily for 4 weeks under double-blind condition. Primary outcomes were constipation severity and stool frequency; secondary outcomes were stool consistency and quantity.

RESULTS:

In intent-to-treat population, compared with baseline, constipation severity and stool frequency improved in both probiotic (n = 47) and control groups (n = 43), but improvements were comparable in both groups at week 4 ($\alpha = 5\%$ level). In probiotic group, stool consistency and quantity at week 4 improved significantly versus baseline but not versus control. Considering that the study agent is non-pharmaceutical and the purpose of supplementation is for long-term effect, re-evaluation at $\alpha = 10\%$ was conducted, which showed significant improvement in constipation severity at week 4 ($P = 0.058$). Magnitude of the probiotic effect on stool consistency was small but grew over time, $d = 0.19$, 95% confidence interval 0.00-0.35 (Week 4), $d = 0.29$, 95% confidence interval 0.11-0.52 (postintervention). Post-hoc exploratory analysis suggests incomplete evacuation may decrease with probiotic intake.

CONCLUSIONS:

Four-week administration of *L. casei* strain Shirota did not alleviate constipation severity or stool frequency, consistency, and quantity when compared with control. With re-evaluation at $\alpha = 10\%$ level, improvement in constipation severity was significant at week 4. To obtain conclusive results, further studies with longer intervention are warranted.

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PMID: 23432408

UPPER C SPINE

Vertebral artery

Clinical Biomechanics

Available online 23 October 2014

Quantifying strain in the vertebral artery with simultaneous motion analysis of the head and neck: A preliminary investigation

- Steven L. Piper^a,
- Samuel J. Howarth^a,
- John Triano^a,
- Walter Herzog^{b,·}

Abstract

Background

Spontaneous vertebral artery dissection has significant mortality and morbidity among young adults. Unfortunately, causal mechanisms remain unclear.

The purpose of this study was to quantify mechanical strain in the vertebral artery while simultaneously capturing motion analysis data during passive movements of the head and neck relative to the trunk during spinal manipulation and cardinal planes of motion.

Methods

Eight piezoelectric crystals (four per vertebral artery) were sutured into the lumen of the left and right vertebral arteries of 3 cadaveric specimens. Strain was then calculated as changes in length between neighboring crystals from a neutral head/neck reference position using ultrasound pulses. Simultaneously, passive motion of the head and neck on the trunk was captured using eight infrared cameras. The instantaneous strain arising in the vertebral artery was correlated with the relative changes in head position.

Findings

Strain in the contralateral vertebral artery during passive flexion-rotation compared to that of extension-rotation is variable ($[df = 32]: -0.61 < r < 0.55$). Peak strain does not coincide with peak angular displacement during spinal manipulation and cardinal planes of motion. Axial rotation displayed the greatest amount of strain. The greatest amount of strain achieved during spinal manipulation was comparably lower than strains achieved during passive end range motions and previously reported failure limits.

Interpretation

The results of this study suggest that vertebral artery strains during head movements including spinal manipulation, do not exceed published failure strains. This study provides new evidence that peak strain in the vertebral artery may not occur at the end range of motion, but rather at some intermediate point during the head and neck motion.

SHOULDER GIRDLE

Dyskinesia

Comprehensive classification test of scapular dyskinesia: A reliability study Manual Therapy, 11/11/2014 Clinical Article

Huang TS, et al.

Abstract

Background

Assessment of scapular dyskinesia (SD) is of clinical interest, as SD is believed to be related to shoulder pathology. However, no clinical assessment with sufficient reliability to identify SD and provide treatment strategies is available. Objectives: The purpose of this study was to investigate the reliability of the comprehensive SD classification method. Design: Cross-sectional reliability study.

Method: Sixty subjects with unilateral shoulder pain were evaluated by two independent physiotherapists with a visual-based palpation method. SD was classified as single abnormal scapular pattern [inferior angle (pattern I), medial border (pattern II), superior border of scapula prominence or abnormal scapulohumeral rhythm (pattern III)], a mixture of the above abnormal scapular patterns, or normal pattern (pattern IV). The assessment of SD was evaluated as subjects performed bilateral arm raising/lowering movements with a weighted load in the scapular plane. Percentage of agreement and kappa coefficients were calculated to determine reliability.

Results: Agreement between the 2 independent physiotherapists was 83% (50/60, 6 subjects as pattern III and 44 subjects as pattern IV) in the raising phase and 68% (41/60, 5 subjects as pattern I, 12 subjects as pattern II, 12 subjects as pattern IV, 12 subjects as mixed patterns I and II) in the lowering phase. The kappa coefficients were 0.49~0.64.

Conclusions: We concluded that the visual-based palpation classification method for SD had moderate to substantial inter-rater reliability. The appearance of different types of SD was more pronounced in the lowering phase than in the raising phase of arm movements.

GLENOHUMERAL/SHOULDER

Instability apprehension test

J Shoulder Elbow Surg. 2014 Oct 10. pii: S1058-2746(14)00424-8. doi: 10.1016/j.jse.2014.07.013.

The supine apprehension test helps predict the risk of recurrent instability after a first-time anterior shoulder dislocation.

Milgrom C¹, Milgrom Y², Radeva-Petrova D³, Jaber S⁴, Beyth S⁵, Finestone AS⁶.

Abstract

BACKGROUND:

We previously identified the positive result of the supine apprehension test after completion of rehabilitation following a first dislocation as a possible predictor of high risk for redislocation. We extend the follow-up of a previous cohort of patients with first-time shoulder dislocations to better assess this test.

METHODS:

Fifty-three men aged 17 to 27 years who sustained a first traumatic shoulder dislocation were treated by shoulder immobilization for 4 weeks and then rehabilitated with a standard physical therapy protocol. At 6-week follow-up, a supine anterior apprehension test was performed to assess the risk of redislocation. The patients were observed prospectively for a minimum of 75 months.

RESULTS:

Of the 53 participants, 52 (mean age, 20.2 years) completed the study follow-up. Of the 52 subjects, 41 (79%) were combat soldiers. Follow-up was between 75 and 112 months. Of the 52 subjects, 31 (60%) redislocated at a range of 3 to 70 months after the initial dislocation. Eleven of 14 subjects (79%; confidence interval, 52%-92%) with a positive anterior apprehension test result redislocated, compared with 20 of 38 patients (53%; confidence interval, 37%-68%) with a negative test result. Patients with a positive test result redislocated more and earlier ($P = .02$, PROC LIFETEST, SAS).

CONCLUSIONS:

The results of the supine apprehension test after a first shoulder dislocation and rehabilitation can help predict risk for recurrent instability. It potentially may be included as a variable in decision analysis models.

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KEYWORDS: Shoulder dislocation; anterior apprehension test; recurrent dislocation; risk; soldiers PMID: 25308067

Anterior instability

Am J Sports Med. 2014 Nov;42(11):2591-6. doi: 10.1177/0363546514551149. Epub 2014 Sep 23.

Risk factors for anterior glenohumeral instability.

Owens BD¹, Campbell SE², Cameron KL³.

Abstract

BACKGROUND:

While anterior glenohumeral instability has been shown to be common in young athletes, the risk factors for injury are poorly understood.

PURPOSE/HYPOTHESIS:

To determine the modifiable and nonmodifiable risk factors for anterior shoulder instability in a high-risk cohort. The hypothesis was that specific baseline factors would be associated with the subsequent risk of injury.

STUDY DESIGN:

Cohort study (prognosis); Level of evidence, 2.

METHODS:

We conducted a prospective cohort study in which 714 young athletes were followed from June 2006 through May 2010. Baseline assessments included a subjective history of instability, physical examination by a sports medicine fellowship-trained orthopaedic surgeon, range of motion, strength with a handheld dynamometer, and bilateral noncontrast shoulder magnetic resonance imaging (MRI). A musculoskeletal radiologist measured glenoid version, glenoid height, glenoid width, glenoid index (height-to-width ratio), glenoid depth, rotator interval (RI) height, RI width, RI area, RI index, and the coracohumeral interval. Subjects were followed to document all acute anterior shoulder instability events during the 4-year follow-up period. The time to anterior shoulder instability event during the follow-up period was the primary outcome of interest. Univariate and multivariable Cox proportional hazards regression models were used to analyze the data.

RESULTS:

Complete data were available for 714 subjects. During the 4-year surveillance period, there were 39 anterior instability events documented at a mean of 285 days. While we controlled for covariates, significant risk factors of physical examination were as follows: apprehension sign (hazard ratio [HR], 2.96; 95% CI, 1.48-5.90; P = .002) and relocation sign (HR, 4.83; 95% CI, 1.75-13.33; P = .002). Baseline range of motion and strength measures were not associated with subsequent injury. Significant anatomic risk factors on MRI measurement were glenoid index (HR, 8.12; 95% CI, 1.07-61.72; P = .043) and the coracohumeral interval (HR, 1.20; 95% CI, 1.08-1.34; P = .001).

CONCLUSION:

This prospective cohort study revealed significant risk factors for shoulder instability in this high-risk population. Physical examination findings of apprehension and relocation were significant while controlling for history of injury. The anatomic variables of significance were not surprising-tall and thin glenoids were at higher risk compared with short and wide glenoids, and the risk of instability increased by 20% for every 1-mm increase in coracohumeral distance.

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KEYWORDS: epidemiology; glenoid labrum; shoulder instability PMID: 25248922

ROTATOR CUFF

Acromial spurs and tears

Am J Sports Med. 2014 Nov;42(11):2621-6. doi: 10.1177/0363546514544683. Epub 2014 Aug 12.

Three-dimensional analysis of acromial morphologic characteristics in patients with and without rotator cuff tears using a reconstructed computed tomography model.

Fujisawa Y¹, Mihata T², Murase T³, Sugamoto K³, Neo M¹.

Abstract

BACKGROUND:

The relationship between rotator cuff tears and acromial shape has yet to be clarified. As a result, the most suitable location for acromioplasty for the treatment of rotator cuff tears is not known.

PURPOSE:

To determine whether any particular change in acromial shape is significantly associated with the presence of rotator cuff tears.

STUDY DESIGN:

Cross-sectional study; Level of evidence, 3.

METHODS:

From 2007 to 2010, we examined 25 consecutive patients with unilateral full-thickness rotator cuff tears who underwent arthroscopic repair and 17 consecutive patients with adhesive capsulitis but intact rotator cuffs who underwent arthroscopic capsular release. Before surgery, a reconstructed 3-dimensional computed tomography model was used to evaluate the acromial structure. Changes in the shape of the affected scapula were qualitatively evaluated relative to the unaffected, contralateral scapula by use of proximity mapping. Differences in acromial structure between affected and unaffected shoulders were assessed at the anterior, lateral, and medial edges and the inferior surface. The association between rotator cuff tear size and change in acromial structure was also evaluated.

RESULTS:

Rates of bony projection at the anterior (>2 mm) and lateral (>3 mm) edges of the acromion in patients with rotator cuff tears were significantly greater compared with rates in patients without rotator cuff tears ($P < .01$). Tear size was not correlated with changes in acromial structure ($P = .37-.73$).

CONCLUSION:

Bone spurs at the anterior and lateral edges of the acromion are associated with the presence of full-thickness rotator cuff tears in symptomatic patients.

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KEYWORDS: acromion; morphology; rotator cuff; shoulder; spur; tear PMID: 25117727

ADHESIVE CAPSULITIS

RCT and AC

Rotator cuff lesions in patients with frozen shoulder: an analysis of 376 stiff shoulders

Journal of Shoulder and Elbow Surgery, 11/12/2014 Review Article

Ueda Y, et al. – Authors reported that if frozen shoulder is strictly defined as severe and global loss of passive range of motion, more than 90% of patients did not demonstrate any rotator cuff lesion. That suggests that full-thickness rotator cuff tear has different pathology from frozen shoulder. The purpose of this study is to examine the rotator cuff lesions in reduced criteria named moderate limited shoulders.

WRIST AND HAND

Lunate / carpal bones

The Effect of Lunate Morphology on the 3-Dimensional Kinematics of the Carpus

Journal of Hand Surgery

Gregory I. Bain, MBBS, PhD, Harry D.S. Clitherow, MBBS , Stuart Millar, BSc, François Fraysse, PhD, John J. Costi, PhD, Kevin Eng, MBBS, Duncan T. McGuire, MBBS, Dominic Thewlis, PhD

Purpose

To assess carpal kinematics in various ranges of motion in 3 dimensions with respect to lunate morphology.

Methods

Eight cadaveric wrists (4 type I lunates, 4 type II lunates) were mounted into a customized platform that allowed controlled motion with 6 degrees of freedom. The wrists were moved through flexion-extension (15° – 15°) and radioulnar deviation (RUD; 20° – 20°). The relative motion of the radius, carpus, and third metacarpal were recorded using optical motion capture methods.

Results

Clear patterns of carpal motion were identified. Significantly greater motion occurred at the radiocarpal joint during flexion-extension of type I wrist than a type II wrist. The relative contributions of the midcarpal and radiocarpal articulations to movement of the wrist differed between the radial, the central, and the ulnar columns. During wrist flexion and extension, these contributions were determined by the lunate morphology, whereas during RUD, they were determined by the direction of wrist motion. The midcarpal articulations were relatively restricted during flexion and extension of a type II wrist. However, during RUD, the midcarpal joint of the central column became the dominant articulation.

Conclusions

This study describes the effect of lunate morphology on 3-dimensional carpal kinematics during wrist flexion and extension. Despite the limited size of the motion arcs tested, the results represent an advance on the current understanding of this topic.

Clinical relevance

Differences in carpal kinematics may explain the effect of lunate morphology on pathological changes within the carpus. Differences in carpal kinematics due to lunate morphology may have implications for the management of certain wrist conditions.

HIP**Hip ROM and tennis injuries**

Am J Sports Med. 2014 Nov;42(11):2654-8. doi: 10.1177/0363546514548852. Epub 2014 Sep 11.

Hip range of motion and association with injury in female professional tennis players.

Young SW¹, Dakic J², Stroia K², Nguyen ML³, Harris AH³, Safran MR⁴.

Abstract**BACKGROUND:**

Adequate hip range of motion is required for the transfer of energy from the lower to the upper extremity along the kinetic chain. Repetitive rotational stresses in the lower extremities during tennis may lead to sport-specific range of motion adaptations, which may increase the risk of injury to other joints along the kinetic chain.

PURPOSE:

To assess whether such range of motion adaptations occur in the hip, and if so, to identify whether they are associated with injury.

STUDY DESIGN:

Cross-sectional study; Level of evidence, 3.

METHODS:

A total of 125 female professional tennis players, the majority of whom were ranked in the top 200 World Tennis Association singles rankings, underwent a comprehensive preparticipation physical health status examination. Hip range of motion was assessed using a digital inclinometer and side-to-side differences in rotational parameters calculated, and associations with previous injuries were identified.

RESULTS:

A history of an abdominal strain was reported by 10% of players, and there was an association between abdominal strains and the presence of hip flexion contractures (odds ratio, 6.1; $P = .006$). Hip flexion contractures were bilateral in 85% of those found, affected only the nondominant side in 9%, and affected only the dominant side in 6%. We were unable to identify any specific side-to-side rotational adaptations in the dominant or nondominant hips, and no association between loss of hip range of motion and shoulder, lower back, hip, knee, or ankle injuries was found.

CONCLUSION:

We report an association in female professional tennis players between abdominal strains and flexion contractures of the hip with iliopsoas tightness. We did not find evidence of specific hip adaptations in rotational range of motion. If hip flexion contractures are found on clinical examination, a stretching program may be indicated. Further studies are required to assess whether such a program can reduce the risk of abdominal injury.

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KEYWORDS: abdominal strains; hip clinical examination; hip range of motion; tennis players
PMID: 25214532

IMPINGEMENT

Efficacy of surgical rx

Int Orthop. 2014 Nov 8.

Femoroacetabular impingement syndrome-efficacy of surgical treatment with regards to age and basic diagnosis.

Chládek P1, Musálek M, Trč T, Zahradník P, Kos P.

Abstract

PURPOSE:

The aim of this study was to assess the outcome of hip preserving surgery for femoroacetabular impingement relative to the condition resulting in FAI and to the patient's age at the time of the surgery.

METHODS:

With the conditions for exclusion duly met, enrolled in our study were a total of 100 hip joints (83 operated on with the aid of SHD, 17 with AMIS). The minimum follow-up period was 12 months, and the mean follow-up time was three years four months. WOMAC and NAHS questionnaires were used as rating instruments. To analyse the significance of the differences relative to the age at the time of surgery and to the basic diagnosis leading to FAI and subsequently to surgical operation we used non-parametric forms of analysis of variance (Friedman test and Kruskal-Wallis test), i.e., comparisons of the patients' pre-operative and postoperative states, estimation of the rate of improvement in the postoperative functional skills in relation to the age at the time of surgery and/or relative to the basic diagnosis necessitating surgical intervention, with respect to statistical significance at the level of $p < 0.05$.

RESULTS:

As testing of our cohort of patients and results analysis showed, the youngest group (<30 years) compared with the rest of the cohort shows greater postoperative improvement and consequently also a better surgical result. Proof was also obtained that the diagnosis leading to surgery for FAI has no effect on the patient's pre- or postoperative state or on the degree of improvement.

CONCLUSIONS:

The results of the study affirm the relevance of hip preserving surgery, especially in younger-aged groups.

PMID: 25380687

Ligamentum teres injury

Arthroscopy. 2014 Aug 14. pii: S0749-8063(14)00534-9. doi: 10.1016/j.arthro.2014.06.013.

Ligamentum Teres Injury Is Associated With the Articular Damage Pattern in Patients With Femoroacetabular Impingement.

Kaya M¹, Suzuki T², Minowa T³, Yamashita T².

Abstract**PURPOSE:**

The objective of this study was to investigate the association between ligamentum teres injury and the hip joint cartilage damage pattern in patients with femoroacetabular impingement.

METHODS:

We compared articular cartilage damage between ligamentum teres-intact and-ruptured hips. Data were collected for 77 consecutive patients with femoroacetabular impingement who underwent hip arthroscopy. The locations of the chondral lesions were recorded on anatomic articular maps using the geographic zone method. The patients were divided into 2 groups (ligamentum teres-intact and-injured groups), and the incidence and degree of cartilage injury were compared between the 2 groups by use of the Mann-Whitney U test.

RESULTS:

In patients with ligamentum teres injury, chondral damage extended to the middle-inferior area of the acetabulum (7.6% [grade 1] in ligamentum teres-intact group and 66.6% [grade 1, 12.1%; grade 2, 42.4%; grade 3, 12.1%] in ligamentum teres-injured group, $P < .01$) and the apex of the femoral head (anterior apex: 7.1% [grade 1, 3.8%; grade 2, 3.3%] in intact group and 42.4% [grade 1, 30.3%; grade 2, 12.1%] in injured group, $P < .01$; middle apex: 7.6% [grade 1, 3.8%; grade 2, 3.8%] in intact group and 63.5% [grade 1, 42.4%; grade 2, 18.1%; grade 3, 3.0%] in injured group, $P = .04$; posterior apex: 7.6% [grade 1, 3.8%; grade 2, 3.8%] in intact group and 42.4% [grade 1, 30.3%; grade 2, 12.1%] in injured group, $P < .01$).

CONCLUSIONS:

This study showed the association between ligamentum teres injury and articular cartilage damage in the inferior middle part of the acetabulum and the apex of the femoral head in patients treated for femoroacetabular impingement.

LEVEL OF EVIDENCE: Level IV, case-control study.

Copyright © 2014 Arthroscopy Association of North America. Published by Elsevier Inc. All rights reserved. PMID: 25129862

KNEE

Anterior lateral ligament

Knee Surg Sports Traumatol Arthrosc. 2014 Nov 8.

Anatomic description of the anterolateral ligament of the knee.

Stijak L¹, Bumbaširević M, Radonjić V, Kadija M, Puškaš L, Milovanović D, Filipović B.

Abstract

PURPOSE:

The anterolateral ligament, a structure that has been known for 130 years, has again attracted the attention both of orthopaedic doctors and anatomists. Since its initial description until now, this structure has had different names. Whether labelled as the mid-third lateral capsular ligament, the anterior oblique band of the fibular collateral ligament or the anterolateral ligament of the knee, this structure has been responsible for the so-called Segond avulsion fractures. The aim of this study was to determine the precise position and layer of the lateral knee compartment within which the anterolateral ligament is located, as well as its type.

METHODS:

In this study, the anatomical dissection of the lateral segment of 14 cadaveric knees (six male, eight female; seven right, seven left; average age of subjects: 78 years) was performed. The dissection was carried out in keeping with Seebacher, layer by layer.

RESULTS:

The anterolateral ligament was identified in seven out of 14 cadaveric knee joints (50 %). The length of the ligament was 41 ± 3 mm, while the width was 4 ± 1 mm and the thickness 1 mm (in the middle section). In 14 % of the cases, the anterior oblique band was identified as a part of the FCL. In all of the knee joints, a part of the fibres of the ITT with the same insertions and direction as the ALL was found, located, however, at a much more superficial level than the ALL.

CONCLUSION:

Analysis of the current scientific literature related to the anterolateral ligament and layer-by-layer dissection of the lateral region of 14 cadaveric knees has led to the conclusion that the anterolateral ligament is a thickening of the knee joint capsule located in the third layer of the lateral region of the knee (according to Seebacher) which is not always clearly morphologically differentiated from the remainder of the joint capsule. The anterolateral ligament is unequivocally a part of the joint capsule, which is why any damage to it should be treated in the same way as any other damage to the joint capsule.

PMID: 25380973

KNEE/ACL**Impact of pre rehab**

Br J Sports Med. 2014 Oct 28. pii: bjsports-2014-093891. doi: 10.1136/bjsports-2014-093891.

How does a combined preoperative and postoperative rehabilitation programme influence the outcome of ACL reconstruction 2 years after surgery? A comparison between patients in the Delaware-Oslo ACL Cohort and the Norwegian National Knee Ligament Registry.

Grindem H¹, Granan LP², Risberg MA³, Engebretsen L⁴, Snyder-Mackler L⁵, Eitzen I⁶.

Abstract**BACKGROUND:**

Preoperative knee function is associated with successful postoperative outcome after anterior cruciate ligament reconstruction (ACLR). However, there are few longer term studies of patients who underwent progressive preoperative and postoperative rehabilitation compared to usual care.

OBJECTIVES:

To compare preoperative and 2 year postoperative patient-reported outcomes (PROs) in patients undergoing progressive preoperative and postoperative rehabilitation at a sports medicine clinic compared with usual care.

METHODS:

We included patients aged 16-40 years undergoing primary unilateral ACLR. The preoperative and 2 year postoperative Knee Injury and Osteoarthritis Outcome Score (KOOS) of 84 patients undergoing progressive preoperative and postoperative rehabilitation at a sports medicine clinic (Norwegian Research Center for Active Rehabilitation (NAR) cohort) were compared with the scores of 2690 patients from the Norwegian National Knee Ligament Registry (NKLR). The analyses were adjusted for sex, age, months from injury to surgery and cartilage/meniscus injury at ACLR.

RESULTS:

The NAR cohort had significantly better preoperative KOOS in all subscales, with clinically relevant differences (>10 points) observed in KOOS Pain, activities of daily living (ADL), Sports and Quality of Life. At 2 years, the NAR cohort still had significantly better KOOS with clinically relevant differences in KOOS Symptoms, Sports and Quality of Life. At 2 years, 85.7-94% of the patients in the NAR cohort scored within the normative range of the different KOOS subscales, compared to 51.4-75.8% of the patients in the NKLR.

CONCLUSIONS:

Patients in a prospective cohort who underwent progressive preoperative and postoperative rehabilitation at a sports medicine clinic showed superior patient-reported outcomes both preoperatively and 2 years postoperatively compared to patients in the NKLR who received usual care.

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KEYWORDS: ACL PMID: 25351782

Rehab

Med Sci Sports Exerc. 2014 Nov 4.

Strength Asymmetry and Landing Mechanics at Return to Sport after ACL Reconstruction.

Schmitt LC¹, Paterno MV, Ford KR, Myer GD, Hewett TE.

Abstract**PURPOSE:**

Evidence-based quadriceps femoris muscle (QF) strength guidelines for return to sport following anterior cruciate ligament (ACL) reconstruction are lacking. This study investigated the impact of QF strength asymmetry on knee landing biomechanics at the time of return to sport following ACL reconstruction.

METHODS:

Seventy-seven individuals (17.4 years) at the time of return to sport following primary ACL reconstruction (ACLR group) and 47 uninjured control individuals (17.0 years) (CTRL group) participated. QF strength was assessed and Quadriceps Index calculated ($QI = [\text{involved strength}/\text{uninvolved strength}] * 100\%$). The ACLR group was sub-divided based on QI: High Quadriceps (HQ, $QI \geq 90\%$) and Low-Quadriceps (LQ, $QI < 85\%$). Knee kinematic and kinetic variables were collected during a drop vertical jump maneuver. Limb symmetry during landing, and discrete variables were compared among the groups with multivariate analysis of variance and linear regression analyses.

RESULTS:

The LQ group demonstrated worse asymmetry in all kinetic and ground reaction force variables compared to the HQ and CTRL groups, including reduced involved limb peak knee external flexion moments ($p < .001$), reduced involved limb ($p = .003$) and increased uninvolved limb ($p = .005$) peak vertical ground reaction forces, and higher uninvolved limb peak loading rates ($p < .004$). There were no differences in the landing patterns between the HQ and CTRL groups on any variable ($p > .05$). In the ACLR group, QF strength estimated limb symmetry during landing after controlling for graft type, meniscus injury, knee pain and symptoms.

CONCLUSION:

At the time of return to sport, individuals post-ACL reconstruction with weaker QF demonstrate altered landing patterns. Conversely, those with nearly symmetrical QF strength demonstrate landing patterns similar to uninjured individuals. Consideration of an objective QF strength measure may aid clinical decision-making to optimize sports participation following ACL reconstruction.

PMID: 25373481

OSTEOARTHRITIS/KNEE**Anti-inflammatory use**

Arthritis Rheumatol. 2014 Nov 4. doi: 10.1002/art.38933.

Effects of prescription non-steroidal anti-inflammatory agents on symptoms and disease progression among patients with knee osteoarthritis.

Lapane KL¹, Yang S, Driban JB, Liu SH, Dubé CE, McAlindon TE, Eaton CB.

Abstract

Objective: The effect of short and long term non-steroidal anti-inflammatory agents (NSAIDs) use on structural change is equivocal. We estimate the extent to which recent and long-term use of prescription NSAIDs relieve symptoms and delay structural progression among patients with radiographically confirmed osteoarthritis (OA) of the knee. **Methods:** We applied a new-user design among participants with confirmed OA not reporting NSAID use at enrollment in the Osteoarthritis Initiative. Participants were evaluated for changes in the Western Ontario and McMaster Universities Arthritis Index, WOMAC (n=1,846) and joint space width measured using serial x-rays and a customized software tool (n=1,116) over 4 years. We used marginal structural modeling to estimate the effect of NSAIDs.

Results: Compared to participants who never reported prescription NSAID use, those reporting use at 1 or 2 assessments had no clinically important changes, but those reporting prescription NSAID use on all 3 assessments had on average 0.88 point improvement over the follow-up period (95% Confidence Interval (CI): -0.46 to 2.22) in Pain, 0.72 point improvement (95% CI: -0.12 to 1.56) in Stiffness, 4.27 points improvement (95% CI: -0.31 to 8.84) in Function, and decreased by 0.28mm in joint space width (95% CI: -0.06 to 0.62) less than no use. Recent NSAID use findings were not clinically or statistically significant.

Conclusions: Long term but not recent NSAID use was associated with a priori defined minimally important clinical change in stiffness, function and structural change but not in pain. While showing modest clinical importance, estimates did not reach statistical significance. © 2014 American College of Rheumatology.

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FOOT AND ANKLE

Management of ankle sprain

Chronic Complaints After Ankle Sprains: A Systematic Review on Effectiveness of Treatments

Authors: John M. van Ochten, MD¹, Marienke van Middelkoop, PhD¹, Duncan Meuffels, MD², Sita M.A. Bierma-Zeinstra, PhD¹

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Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2014, **Volume:** 44 **Issue:** 11 **Pages:** 862-C23 doi:10.2519/jospt.2014.5221

Study Design Systematic review. **Objective** To determine the effectiveness of treatments for patients with chronic complaints after ankle sprain.

Background Though most people recover completely after a lateral inversion ankle injury, a considerable percentage have persistent complaints. Currently, it is still unclear which treatment options are best for these patients.

Methods Major databases, including PubMed, Embase, CINAHL, and PEDro, were searched for randomized controlled trials and controlled clinical trials conducted from 1966 to October 2012. Due to clinical heterogeneity, the data were analyzed using a best-evidence synthesis.

Results A total of 20 randomized controlled trials and 1 controlled clinical trial were included in the analysis. The included studies compared different treatments (training programs, physiotherapy, chiropractic/manual therapy, surgery, postoperative training, and functional treatment). For pain and function outcomes, limited to moderate evidence was found for effectiveness of a training program compared to conservative treatment. Two studies found a decrease of recurrences after a proprioceptive training program. Four studies showed good results for different surgical methods but did not include a nonsurgical control group for comparison. Limited evidence was found for the effectiveness of an early mobilization program after surgery.

Conclusion In chronic ankle complaints after an ankle sprain, a training program gives better results for pain and function, and a decrease of recurrent ankle sprains, than a wait-and-see policy. There was insufficient evidence to determine the most effective surgical treatment, but limited evidence suggests that postoperative, early mobilization was more effective than a plaster cast.

Level of Evidence Therapy, level 1a-. *J Orthop Sports Phys Ther* 2014;44(11):862–871. Epub 9 October 2014. doi:10.2519/jospt.2014.5221

Ankle sprain and manipulation

Manipulative therapy and rehabilitation for recurrent ankle sprain with functional instability: a short-term, assessor-blind, parallel-group randomized trial

Journal of Manipulative and Physiological Therapeutics, 11/14/2014 Clinical Article

Lubbe D, et al.

Objective

The purpose of this study was to compare manipulative therapy (MT) plus rehabilitation to rehabilitation alone for recurrent ankle sprain with functional instability (RASFI) to determine short-term outcomes.

Methods

This was an assessor-blind, parallel-group randomized comparative trial. Thirty-three eligible participants with RASFI were randomly allocated to receive rehabilitation alone or chiropractic MT plus rehabilitation. All participants undertook a daily rehabilitation program over the course of the 4-week treatment period. The participants receiving MT had 6 treatments over the same treatment period. The primary outcome measures were the Foot and Ankle Disability Index and the visual analogue pain scale, with the secondary outcome measure being joint motion palpation. Data were collected at baseline and during week 5. Missing scores were replaced using a multiple imputation method. Statistical analysis of the data composed of repeated-measures analysis of variance.

Results

Between-group analysis demonstrated a difference in scores at the final consultation for the visual analogue scale and frequency of joint motion restrictions ($P \leq .006$) but not for the Foot and Ankle Disability Index ($P = .26$).

Conclusions

This study showed that the patients with RASFI who received chiropractic MT plus rehabilitation showed significant short-term reduction in pain and the number of joint restrictions in the short-term but not disability when compared with rehabilitation alone.

Key Indexing Terms: Ankle Injuries, Musculoskeletal Manipulations, Rehabilitation

MANUAL THERAPY

McKenzie & LBP

J Orthop Sports Phys Ther. 2014 Oct 29:1-40.

Physical Therapists' Level of McKenzie Education, Functional Outcomes, and Utilization in Patients With Low Back Pain.

Deutscher D¹, Werneke MW, Gottlieb D, Fritz JM, Resnik L.

Abstract

Study Design Longitudinal, prospective, observational cohort. Objective Examine associations between McKenzie training, functional status (FS) at discharge, and number of physical therapy visits (utilization), for patients receiving physical therapy for low back pain (LBP). Background McKenzie method is commonly used in treating patients with LBP.

Methods A McKenzie post-graduate educational program was initiated in a large outpatient physical therapy service. FS data were collected at intake and at discharge. Separate hierarchical linear mixed models were used to examine associations between physical therapists' McKenzie training level (none, Parts A, B, C, D, and credential), FS score at discharge, and utilization, controlling for patient risk factors.

Results Final dataset included 20882 patients (mean age (SD) = 51(16) years, 57% women), who completed FS surveys both at admission and discharge. Patients treated by physical therapists with any McKenzie training had better outcomes (additional 0.7 to 1.3 FS points; $P < .05 - < .001$), and fewer visits (0.6 to 0.9 $P < 0.001$), compared with patients treated by physical therapists with no training. For patients treated by therapists with no versus some McKenzie education, 65% versus 70% achieved at least the minimal clinically important improvement (MCII), respectively. There were no significant differences in outcomes or utilization by level of McKenzie training.

Conclusions There was a slightly greater improvement of 0.7-1.3 points in discharge FS in patients receiving physical therapy for LBP by physical therapists who underwent McKenzie training. This difference was clinically important for an additional 5% of patients who achieved the MCII if treated by therapists with some McKenzie training. Reduction in physical therapy utilization was 0.6-0.9 visits, with fewest visits utilized by patients of physical therapists at the McKenzie Part D and credentialed level. Together these findings suggest improved cost-effectiveness at advanced McKenzie training levels. Ways to improve ongoing education and patient outcomes were proposed. Level of Evidence Therapy, level 2b. J Orthop Sports Phys Ther, Epub 29 October 2014. doi:10.2519/jospt.2014.5272.

KEYWORDS: McKenzie functional status; continuing education; cost-effectiveness; lumbar spine PMID: 25353260

Neural mobilization for elbow pain

Open Orthop J. 2014 Oct 17;8:368-71. doi: 10.2174/1874325001408010368. eCollection 2014.

Radial nerve mobilization reduces lateral elbow pain and provides short-term relief in computer users.

Arumugam V¹, Selvam S², MacDermid JC³.

Author information

- ¹University of Western Ontario, Health and Rehabilitation Sciences, Faculty of Health Sciences, London, Ontario, Canada.
- ²Vel's School of Physiotherapy, Vel's University, Chennai, India.
- ³McMaster University, School of Rehabilitation Science, Hamilton, Ontario, Canada; Clinical Research, Roth McFarlane Hand and Upper Limb Center, St. Joseph's Hospital, London, Ontario, Canada.

Abstract**STUDY DESIGN:**

Prospective Experimental Study.

BACKGROUND:

Computer users may be at risk of lateral elbow pain. It is theorized that adverse mechanical tension can arise in the radial nerve with sustained keyboarding due to sustained static work of the elbow extensor muscles. Neural mobilization has been suggested as a potential treatment.

PURPOSE:

The purpose of this study was to evaluate the effect of neural mobilization of the radial nerve on a single occasion in terms of its ability to reduce lateral elbow pain.

METHODS AND ANALYSIS:

Forty-one computer professionals (Mean age 46.7; S.D. 12.77), who had experienced lateral elbow pain for a mean of 2.87 months were recruited. The participants rated the pain using a verbal, numeric rating scale (NRS). Radial nerve tension was tested using the Upper limb Tension Test (ULTT) for radial nerve in both upper extremities. The radial nerve was mobilized using a series of 8 oscillations and repeated 3 times with a one minute rest in between. The NRS and ULLT were repeated after treatment and the scores compared using a paired t-test by the first author.

RESULTS:

The mean NRS scores decreased significantly from 5.7 (1.1) to 3.8 (1.4) ($p < 0.000$; $t \text{ value} = 8.07$).

CONCLUSION:

A single session of 3 neural mobilization resulted in a reduction of pain in computer users with lateral elbow pain. A long-term randomized trial is needed to determine the effects sustained over-time.

KEYWORDS: Butler's technique of neural mobilization; lateral elbow pain; neural tension testing; numerical rating scale. PMID: 25352930

C 7 Manipulation

JMMT Volume 22, Issue 4 (November 2014), pp. 206-212

A comparison of two non-thrust mobilization techniques applied to the C7 segment in patients with restricted and painful cervical rotation

Doug Creighton; Mark Gruca; Douglas Marsh; Nancy Murphy

Author Affiliations

DOI: <http://dx.doi.org/10.1179/2042618614Y.0000000077>

Abstract

Objectives:

Cervical mobilization and manipulation have been shown to improve cervical range of motion and pain. Rotatory thrust manipulation applied to the lower cervical segments is associated with controversy and the potential for eliciting adverse reactions (AR). The purpose of this clinical trial was to describe two translatory non-thrust mobilization techniques and evaluate their effect on cervical pain, motion restriction, and whether any adverse effects were reported when applied to the C7 segment.

Methods:

This trial included 30 participants with painful and restricted cervical rotation. Participants were randomly assigned to receive one of the two mobilization techniques. Active cervical rotation and pain intensity measurements were recorded pre- and post-intervention. Within group comparisons were determined using the Wilcoxon signed-rank test and between group comparisons were analyzed using the Mann-Whitney *U* test. Significance was set at $P=0.05$.

Results:

Thirty participants were evaluated immediately after one of the two mobilization techniques was applied. There was a statistically significant difference (improvement) for active cervical rotation after application of the C7 facet distraction technique for both right ($P=0.022$) and left ($P=0.022$) rotation. Statistically significant improvement was also found for the C7 facet gliding technique for both right ($P=0.022$) and left rotation ($P=0.020$). Pain reduction was statistically significant for both right and left rotation after application of both techniques. Both mobilization techniques produced similar positive effects and one was not statistically superior to the other.

Discussion:

A single application of both C7 mobilization techniques improved active cervical rotation, reduced perceived pain, and did not produce any AR in 30 patients with neck pain and movement limitation. These two non-thrust techniques may offer clinicians an additional safe and effective manual intervention for patients with limited and painful cervical rotation. A more robust experimental design is recommended to further examine these and similar cervical translatory mobilization techniques.

Pelvic patterns and wrist mobility – PNF**Effect of remote after-effects of resistive static contraction of the pelvic depressors on improvement of restricted wrist flexion range of motion in patients with restricted wrist flexion range of motion**

Journal of Bodywork & Movement Therapies , 11/14/2014 Clinical Article

Mitsuo A, et al. –

The objective of the study was to compare the effects of remote aftereffects of resistive static contraction of the pelvic depressors (RSCPD) with aftereffects of static contraction of upper extremity muscles (SCUE) on improvement of the maximal active range of motion (MAROM) for patients with restricted wrist flexion range of motion (ROM) due to upper limb pain and dysfunction. One-way repeated measures ANOVA showed significant main effects in evaluation of the change in MAROM and IEMG activities for different conditions (after rest, after SCUE, and after RSCPD). The remote aftereffects of RSCPD, but not those of SCUE, caused significant improvement in MAROM for restricted wrist flexion ROM.

- The participants were 10 outpatients with restricted wrist joints.
- The mean (SD) age was 53.7 (4.4) years (range, 34–81).
- The subjects performed two exercise protocols (SCUE and RSCPD) in random order.
- One-way repeated measures ANOVA showed significant main effects in evaluation of the change in MAROM and IEMG activities for different conditions (after rest, after SCUE, and after RSCPD).

T spine mobilization impact on C spine mobility

JMMT Volume 22, Issue 4 (November 2014), pp. 191-198

The immediate effects of thoracic transverse mobilization in patients with the primary complaint of mechanical neck pain: a pilot study

C. Indy McGregor¹; Robert Boyles¹; Laura Murahashi²; Tanya Sena³; Robert Yarnall⁴

Author Affiliations

Keywords: Transverse vertebral pressure, Thoracic mobilization, Neck pain

DOI: <http://dx.doi.org/10.1179/2042618614Y.0000000073>

Abstract

Objective:

Posterior-to-anterior (PA) vertebral mobilization to the thoracic spine has been studied as an intervention for neck pain. Our purpose was to explore effects of a different mobilization technique, transverse vertebral pressure, on cervical range of motion (ROM) and pain when applied to the thoracic spine among participants with neck pain.

Methods:

A single-blinded quasi-experimental study with a one-group pretest–posttest design. A transverse group consisted of 21 participants whose neck pain increased with active movements. A non-intervention group of 20 asymptomatic participants was included simply to ensure rater blinding. The treatment group received Grades IV to IV+ transverse mobilizations at T1 through T4 bilaterally. Measurements taken immediately after intervention included pre/post cervical ROM, distant pressure pain threshold (PPT), and a numerical pain rating scale (NPRS). Analysis utilized *t*-tests and ordinal counterparts.

Results:

The transverse group demonstrated significant gains in extension and bilateral rotation ($P \leq 0.005$) but not flexion or side-bend. A total of 57% of mobilized participants reported clinically meaningful decreased pain ($P < 0.001$). Seven participants exceeded the PPT MDC₉₅ of 0.36 kg/cm². The non-intervention group had no significant changes in ROM or NPRS scores.

Discussion:

After 8 minutes of transverse mobilization to the upper thoracic spine, significant gains in cervical extension and bilateral rotation, and decreased pain scores were found. There were no adverse effects. Unlike other mobilization studies, PPT changes at a remote site were statistically but not clinically meaningful. Findings suggest that transverse mobilization would be a productive topic for controlled clinical trials.

Keywords: Transverse vertebral pressure, Thoracic mobilization, Neck pain

PNF LBP

J Phys Ther Sci. 2014 Oct;26(10):1571-4. doi: 10.1589/jpts.26.1571. Epub 2014 Oct 28.

The Effects on the Pain Index and Lumbar Flexibility of Obese Patients with Low Back Pain after PNF Scapular and PNF Pelvic Patterns.

Park K¹, Seo K².

Author information

- ¹Department of Rehabilitation Technology, Korea Nazarene University, Republic of Korea.
- ²Department of Physical Therapy, Korea Nazarene University, Republic of Korea.

Abstract

[Purpose] The purpose of this study was to determine whether exercises using proprioceptive neuromuscular facilitation (PNF) scapular and pelvic patterns might decrease the pain index and increase the lumbar flexibility of obese patients with low back pain. [

Subjects and Methods] Thirty obese patients with low back pain were randomly assigned to an experimental group (n=15) and a control group (n=15). The exercise program of the experimental group consisted of scapular patterns (anterior depression - posterior elevation) and pelvic patterns (anterior elevation - posterior depression). The control group performed neutral back muscle strengthening exercises. Over the course of four weeks, the groups participated in PNF or performed strengthening exercises for 30 minutes, three times per week. Subjects were assessed a pre-test and post-test using measurements of pain and lumbar flexibility.

[Results] The results show that lumbar flexion and lumbar extension significantly improved in the experimental group, had significant improvement and that the Oswestry Disability index (ODI) significantly decreased. However, there were no significant changes in the control group. The experimental group also showed significant differences in the pain index and lumbar flexibility from the control group.

[Conclusion] This study showed that PNF can be used to improve pain index rating and lumbar flexibility. The findings indicate that the experimental group experienced greater improvement than the control group by participating in the PNF lumbar stabilization program.

KEYWORDS: Low back pain; Obesity; Proprioceptive neuromuscular facilitation PMID: 25364115

Adverse events with manipulations

Manual Therapy Volume 19, Issue 5, p365-508 October 2014

Adverse events among seniors receiving spinal manipulation and exercise in a randomized clinical trial

Michele Maiers 

Received: March 12, 2014; Received in revised form: September 29, 2014; Accepted: October 7, 2014; Published Online: October 13, 2014

DOI: <http://dx.doi.org/10.1016/j.math.2014.10.003>

Spinal manipulative therapy (SMT) and exercise have demonstrated effectiveness for neck pain (NP). Adverse events (AE) reporting in trials, particularly among elderly participants, is inconsistent and challenges informed clinical decision making.

This paper provides a detailed report of AE experienced by elderly participants in a randomized comparative effectiveness trial of SMT and exercise for chronic NP.

AE data, consistent with CONSORT recommendations, were collected on elderly participants who received 12 weeks of SMT with home exercise, supervised plus home exercise, or home exercise alone. Standardized questions were asked at each treatment; participants were additionally encouraged to report AE as they occurred. Qualitative interviews documented participants' experiences with AE. Descriptive statistics and content analysis were used to categorize and report these data.

Compliance was high among the 241 randomized participants. Non-serious AE were reported by 130/194 participants. AE were reported by three times as many participants in supervised plus home exercise, and nearly twice as many as in SMT with home exercise, as in home exercise alone. The majority of AE were musculoskeletal in nature; several participants associated AE with specific exercises. One incapacitating AE occurred when a participant fell during supervised exercise session and fractured their arm. One serious adverse event of unknown relationship occurred to an individual who died from an aneurysm while at home. Eight serious, non-related AE also occurred.

Musculoskeletal AE were common among elderly participants receiving SMT and exercise interventions for NP. As such, they should be expected and discussed when developing care plans.

Keywords: **Adverse events**, **Elderly**, **Spinal manipulation**, **Exercise**

Hip traction of hip and joint space

J Manipulative Physiol Ther. 2014 Oct;37(8):580-5. doi: 10.1016/j.jmpt.2014.08.002. Epub 2014 Sep 4.

Immediate effects of manual traction on radiographically determined joint space width in the hip joint.

Sato T¹, Sato N², Masui K³, Hirano Y⁴.

Abstract

OBJECTIVE:

The purpose of this study was to investigate the immediate effects of manual traction of the hip joint on joint space width (JSW) on asymptomatic subjects.

METHODS:

Asymptomatic, healthy male volunteers (n = 15), aged 25 to 34 years were included in this study. Three radiographs were obtained with the subjects in the supine position, before and after loading with 10% of his body weight, and after manual traction on only the right hip joint. Joint space width was measured by a radiologist at the point described by Jacobson and Sonne-Holm.

RESULTS:

There were significant changes in JSW on the right hip joint and left hip joint between the baseline (before loading) and immediately after loading. We also observed a significantly increased JSW on only the right hip joint between periods that followed loading and manual traction on the right hip joint. There was no significant change in JSW on the left hip joint between periods that followed loading and manual traction on the right hip joint.

CONCLUSIONS:

The results of this study suggest that a significant increase in JSW in young, healthy male patients can occur immediately after manual traction of the hip joint.

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KEYWORDS: Hip; Osteoarthritis; Radiography; Traction PMID: 25200270

STM**Friction massage and elbow**

Cochrane Database Syst Rev. 2014 Nov 8;11:CD003528.

Deep transverse friction massage for treating lateral elbow or lateral knee tendinitis.

Loew LM¹, Brosseau L, Tugwell P, Wells GA, Welch V, Shea B, Poitras S, De Angelis G, Rahman P.

BACKGROUND:

Deep transverse friction massage, one of several physical therapy interventions suggested for the management of tendinitis pain, was first demonstrated in the 1930s by Dr James Cyriax, a renowned orthopedic surgeon in England. Its goal is to prevent abnormal fibrous adhesions and abnormal scarring. This is an update of a Cochrane review first published in 2001.

OBJECTIVES:

To assess the benefits and harms of deep transverse friction massage for treating lateral elbow or lateral knee tendinitis.

SEARCH METHODS:

We searched the following electronic databases: the specialized central registry of the Cochrane Field of Physical and Related Therapies, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Clinicaltrials.gov, and the Physiotherapy Evidence Database (PEDro), up until July 2014. The reference lists of these trials were consulted for additional studies.

SELECTION CRITERIA:

All randomized controlled trials (RCTs) and controlled clinical trials (CCTs) comparing deep transverse friction massage with control or other active interventions for study participants with two eligible types of tendinitis (ie, extensor carpi radialis tendinitis (lateral elbow tendinitis, tennis elbow or lateral epicondylitis or lateralis epicondylitis humeri) and iliotibial band friction syndrome (lateral knee tendinitis)) were selected. Only studies published in English and French languages were included.

DATA COLLECTION AND ANALYSIS:

Two review authors independently assessed the studies on the basis of inclusion and exclusion criteria. Results of individual trials were extracted from the included study using extraction forms prepared by two independent review authors before the review was begun. Data were cross-checked by a third review author. Risk of bias of the included studies was assessed using the "Risk of bias" tool of The Cochrane Collaboration. A pooled analysis was performed using mean difference (MD) for continuous outcomes and risk ratio (RR) for dichotomous outcomes with 95% confidence intervals (CIs).

MAIN RESULTS:

Two RCTs (no new additional studies in this update) with 57 participants met the inclusion criteria. These studies demonstrated high risk of performance and detection bias, and the risk of selection, attrition, and reporting bias was unclear. The first study included 40 participants with lateral elbow tendinitis and compared (1) deep transverse friction massage combined with therapeutic ultrasound and placebo ointment (n = 11) versus therapeutic ultrasound and placebo ointment only (n = 9) and (2) deep transverse friction massage combined with phonophoresis (n = 10) versus phonophoresis only (n = 10). No statistically significant differences were reported

within five weeks for mean change in pain on a 0 to 100 visual analog scale (VAS) (MD -6.60, 95% CI -28.60 to 15.40; 7% absolute improvement), grip strength measured in kilograms of force (MD 0.10, 95% CI -0.16 to 0.36) and function on a 0 to 100 VAS (MD -1.80, 95% CI -0.18.64 to 15.04; 2% improvement), pain-free function index measured as the number of pain-free items (MD 1.10, 95% CI -1.00 to 3.20) and functional status (RR 3.3, 95% CI 0.4 to 24.3) for deep transverse friction massage, and therapeutic ultrasound and placebo ointment compared with therapeutic ultrasound and placebo ointment only. Likewise for deep transverse friction massage and phonophoresis compared with phonophoresis alone, no statistically significant differences were found for pain (MD -1.2, 95% CI -20.24 to 17.84; 1% improvement), grip strength (MD -0.20, 95% CI -0.46 to 0.06) and function (MD 3.70, 95% CI -14.13 to 21.53; 4% improvement). In addition, the GRADE (Grades of Recommendation, Assessment, Development and Evaluation) approach was used to evaluate the quality of evidence for the pain outcome, which received a score of "very low". Pain relief of 30% or greater, quality of life, patient global assessment, adverse events, and withdrawals due to adverse events were not assessed or reported. The second study included 17 participants with iliotibial band friction syndrome (knee tendinitis) and compared deep transverse friction massage with physical therapy intervention versus physical therapy intervention alone, at two weeks. Deep transverse friction massage with physical therapy intervention showed no statistically significant differences in the three measures of pain relief on a 0 to 10 VAS when compared with physical therapy alone: daily pain (MD -0.40, 95% CI -0.80 to -0.00; absolute improvement 4%), pain while running (scale from 0 to 150) (MD -3.00, 95% CI -11.08 to 5.08), and percentage of maximum pain while running (MD -0.10, 95% CI -3.97 to 3.77). For the pain outcome, absolute improvement showed a 4% reduction in pain. However, the quality of the body of evidence received a grade of "very low." Pain relief of 30% or greater, function, quality of life, patient global assessment of success, adverse events, and withdrawals due to adverse events were not assessed or reported.

AUTHORS' CONCLUSIONS:

We do not have sufficient evidence to determine the effects of deep transverse friction on pain, improvement in grip strength, and functional status for patients with lateral elbow tendinitis or knee tendinitis, as no evidence of clinically important benefits was found. The confidence intervals of the estimate of effects overlapped the null value for deep transverse friction massage in combination with physical therapy compared with physical therapy alone in the treatment of lateral elbow tendinitis and knee tendinitis. These conclusions are limited by the small sample size of the included randomized controlled trials. Future trials, utilizing specific methods and adequate sample sizes, are needed before conclusions can be drawn regarding the specific effects of deep transverse friction massage on lateral elbow tendinitis. PMID: 25380079

EXERCISE

Graded motor imaging

Clin J Pain. 2014 Dec;30(12):1070-5. doi: 10.1097/AJP.0000000000000066.

Motor imagery in people with a history of back pain, current back pain, both, or neither.

Bowering KJ¹, Butler DS, Fulton IJ, Moseley GL.

Abstract

INTRODUCTION:

There is mounting evidence that cortical maps are disrupted in chronic limb pain and that these disruptions may contribute to the problem and be a viable target for treatment. Little is known as to whether this is also the case for the most common and costly chronic pain-back pain.

OBJECTIVES:

To investigate the effects of back pain characteristics on the performance of left/right trunk judgment tasks, a method of testing the integrity of cortical maps.

METHODS:

A total of 1008 volunteers completed an online left/right trunk judgment task in which they judged whether a model was rotated or laterally flexed to the left or right in a series of images.

RESULTS:

Participants who had back pain at the time of testing were less accurate than pain-free controls ($P=0.027$), as were participants who were pain free but had a history of back pain ($P<0.01$). However, these results were driven by an interaction such that those with current back pain and a history of back pain were less accurate (mean [95% CI]=76% [74%-78%]) than all other groups (>84% [83%-85%]).

DISCUSSION:

Trunk motor imagery performance is reduced in people with a history of back pain when they are in a current episode. This is consistent with disruption of cortical proprioceptive representation of the trunk in this group. On the basis of this result, we propose a conceptual model speculating a role of this measure in understanding the development of chronic back pain, a model that can be tested in future studies.

PMID: 24535054

CORE**Motor control**

Phys Ther. 2014 Nov;94(11):1543-54. doi: 10.2522/ptj.20140014. Epub 2014 Jul 10.

Predicting response to motor control exercises and graded activity for patients with low back pain: preplanned secondary analysis of a randomized controlled trial.

Macedo LG¹, Maher CG², Hancock MJ³, Kamper SJ⁴, McAuley JH⁵, Stanton TR⁶, Stafford R⁷, Hodges PW⁸.

Abstract**BACKGROUND:**

Current treatments for low back pain have small effects. A research priority is to identify patient characteristics associated with larger effects for specific interventions.

OBJECTIVE:

The aim of this study was to identify simple clinical characteristics of patients with chronic low back pain who would benefit more from either motor control exercises or graded activity.

DESIGN:

This study was a secondary analysis of the results of a randomized controlled trial.

METHODS:

One hundred seventy-two patients with chronic low back pain were enrolled in the trial, which was conducted in Australian physical therapy clinics. The treatment consisted of 12 initial exercise sessions over an 8-week period and booster sessions at 4 and 10 months following randomization. The putative effect modifiers (psychosocial features, physical activity level, walking tolerance, and self-reported signs of clinical instability) were measured at baseline. Measures of pain and function (both measured on a 0-10 scale) were taken at baseline and at 2, 6, and 12 months by a blinded assessor.

RESULTS:

Self-reported clinical instability was a statistically significant and clinically important modifier of treatment response for 12-month function (interaction: 2.72; 95% confidence interval=1.39 to 4.06). Participants with high scores on the clinical instability questionnaire (≥ 9) did 0.76 points better with motor control exercises, whereas those who had low scores (< 9) did 1.93 points better with graded activity. Most other effect modifiers investigated did not appear to be useful in identifying preferential response to exercise type.

LIMITATIONS:

The psychometric properties of the instability questionnaire have not been fully tested.

CONCLUSIONS:

A simple 15-item questionnaire of features considered indicative of clinical instability can identify patients who respond best to either motor control exercises or graded activity.

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SCOLIOSIS

Melatonin deficiency

J Pediatr Orthop. 2014 Dec;34(8):768-73. doi: 10.1097/BPO.0000000000000207.

Higher levels of melatonin in early stages of adolescent idiopathic scoliosis: toward a new scenario.

Goultidis TT¹, Papavasiliou KA, Petropoulos AS, Philippopoulos A, Kapetanos GA.

Abstract

BACKGROUND:

The melatonin deficiency hypothesis as a central mechanism in the pathogenesis of adolescent idiopathic scoliosis (AIS) is certainly intriguing. However, the actual role of melatonin remains unclear. The aim of this study was to assess the potential clinical value of melatonin serum level in the pathogenesis and the prognosis of AIS progression in patients who were treated nonoperatively.

METHODS:

Two groups of patients were enrolled. The study group consisted of patients with AIS aged below 14 years who were treated conservatively. In the second group, that is, the control group, age-matched, weight-matched, and height-matched healthy individuals were enrolled. Blood samples were collected from all patients on visit 1 and the serum levels of melatonin were evaluated with the enzyme-linked immunosorbent assay (ELISA) method. The blood sampling procedure was repeated exactly 1 year later (visit 2).

RESULTS:

Forty-two patients formed the study group (with AIS) and 29 served as the control group. The mean serum value of melatonin on visit 1 was 19.32 pg/mL for the AIS group and 12.23 pg/mL for the control group. This difference was statistically significant ($P=0.014$). One year later, 34 patients from the AIS group and 23 from the control group were reevaluated and the mean serum levels of melatonin were 52.43 and 68.44 pg/mL, respectively. No statistically significant difference was found between the 2 groups ($P=0.235$). Statistical analysis of the serum melatonin levels of patients with progressing AIS (>5 degrees of the Cobb angle in 1 y) when compared with patients with stable AIS ($P=0.387$) or the control group ($P=0.727$) failed to show that the deficiency of melatonin may be associated with the progression of AIS.

CONCLUSIONS:

Higher melatonin levels were observed in conservatively treated patients with AIS, whereas melatonin deficiency was not associated with AIS progression in this study.

LEVEL OF EVIDENCE: Level III-case-control study. PMID: 24787309

ATHLETICS

Impact of warm up ex on balance

J Phys Ther Sci. 2014 Oct;26(10):1601-3. doi: 10.1589/jpts.26.1601. Epub 2014 Oct 28.

The Effects of Diverse Warm-up Exercises on Balance.

Kim K¹, Lee T², Kang G², Kwon S², Choi S², Park S².

Abstract

[Purpose] To examine how stretching, plyometric, and treadmill exercises influence the dynamic balance necessary for sports activities. [

Subjects and Methods] Twenty-two healthy subjects participated in this study. The subjects conducted stretching, plyometric exercises, and treadmill walking for set times over a period of three days. The subjects' dynamic balance was then measured. The measurements were taken prior to the intervention, immediately after the intervention, and 20 minutes after the intervention. All the intervention times were set at 16 minutes, excluding resting times. The data were analyzed with using the two-way ANOVA.

[Results] There was no interaction between exercises and time. There were no statistical differences among the exercises and no statistical differences in changes over time.

[Conclusion] This study found that warm-up exercises such as plyometric exercises, stretching, and treadmill walking have no effect on the dynamic of balance in healthy subjects.

KEYWORDS: Plyometric; Stretching; Treadmill walking PMID: 25364123

Lumbopelvic control in baseball pitchers

Am J Sports Med. 2014 Nov;42(11):2734-40. doi: 10.1177/0363546514545861. Epub 2014 Aug 26.

Lumbopelvic control and days missed because of injury in professional baseball pitchers.

Chaudhari AM¹, McKenzie CS², Pan X³, Oñate JA⁴.

Abstract

BACKGROUND:

Recently, lumbopelvic control has been linked to pitching performance, kinematics, and loading; however, poor lumbopelvic control has not been prospectively investigated as a risk factor for injuries in baseball pitchers.

HYPOTHESIS:

Pitchers with poor lumbopelvic control during spring training are more likely to miss ≥ 30 days because of an injury through an entire baseball season than pitchers with good lumbopelvic control.

STUDY DESIGN:

Cohort study; Level of evidence, 2.

METHODS:

A total of 347 professional baseball pitchers were enrolled into the study during the last 2 weeks of spring training and stayed with the same team for the entire season. Lumbopelvic control was quantified by peak anterior-posterior deviation of the pelvis relative to the starting position during a single-leg raise test (APScore). Days missed because of an injury through the entire season were recorded by each team's medical staff.

RESULTS:

A higher APScore was significantly associated with a higher likelihood of missing ≥ 30 days ($P = .023$, χ^2 test). When divided into tertiles based on their APScore, participants in the highest tertile were 3.0 times and 2.2 times more likely to miss at least 30 days throughout the course of a baseball season relative to those in the lowest or middle tertiles, respectively. A higher APScore was also significantly associated with missing more days because of an injury within participants who missed at least 1 day ($P = .018$, ANOVA), with participants in the highest tertile missing significantly more days (mean, 98.6 days) than those in the middle tertile (mean, 45.8 days; $P = .017$) or lowest tertile (mean, 43.8 days; $P = .017$).

CONCLUSION:

This study found that poor lumbopelvic control in professional pitchers was associated with an increased risk of missing significant time because of an injury.

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KEYWORDS: athlete; balance; core stability; lumbar spine; pelvis PMID: 25159541

Tennis serve

Am J Sports Med. 2014 Nov;42(11):2751-60. doi: 10.1177/0363546514547173. Epub 2014 Aug 28.

Energy flow analysis during the tennis serve: comparison between injured and noninjured tennis players.

Martin C¹, Bideau B², Bideau N², Nicolas G², Delamarche P², Kulpa R².

Abstract**BACKGROUND:**

Energy flow has been hypothesized to be one of the most critical biomechanical concepts related to tennis performance and overuse injuries. However, the relationships among energy flow during the tennis serve, ball velocity, and overuse injuries have not been assessed.

PURPOSE:

To investigate the relationships among the quality and magnitude of energy flow, the ball velocity, and the peaks of upper limb joint kinetics and to compare the energy flow during the serve between injured and noninjured tennis players.

STUDY DESIGN:

Case-control study; Level of evidence, 3.

METHODS:

The serves of expert tennis players were recorded with an optoelectronic motion capture system. The forces and torques of the upper limb joints were calculated from the motion captures by use of inverse dynamics. The amount of mechanical energy generated, absorbed, and transferred was determined by use of a joint power analysis. Then the players were followed during 2 seasons to identify upper limb overuse injuries with a questionnaire. Finally, players were classified into 2 groups according to the questionnaire results: injured or noninjured.

RESULTS:

Ball velocity increased and upper limb joint kinetics decreased with the quality of energy flow from the trunk to the hand + racket segment. Injured players showed a lower quality of energy flow through the upper limb kinetic chain, a lower ball velocity, and higher rates of energy absorbed by the shoulder and elbow compared with noninjured players.

CONCLUSION:

The findings of this study imply that improper energy flow during the tennis serve can decrease ball velocity, increase upper limb joint kinetics, and thus increase overuse injuries of the upper limb joints.

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KEYWORDS: biomechanics; energy flow; injuries; tennis serve PMID: 25167995

Cycling strategies

Med Sci Sports Exerc. 2014 Nov 6. [Epub ahead of print]

Neuromuscular Strategies during Cycling at Different Muscular Demands.

Enders H¹, von Tscharner V, Nigg BM.

Abstract

PURPOSE:

This study investigated muscle coordination while pedaling at 150W and 300W with a cadence of 90 RPM. Changes in the variability of the electromyographic signals (EMG) were quantified in fourteen subjects.

METHODS:

Principal component analysis was used to find correlated EMG patterns among seven leg muscles that reflect neuromuscular strategies while pedaling. Sample entropy was used to assess the regularity of the short-term fluctuations of the EMG. Signal structure relates to the autocorrelation and to the information in the phase of the signal. This study used the information encrypted in the phase to quantify neuromuscular control and compared the results to phase-randomized surrogate data.

RESULTS:

Even though the pattern remained similar, the correlation between individual muscles showed effort-dependent differences. Increased workload altered the overall neuromuscular strategy indicated by changes in the contribution of individual muscles to the movement. Additionally, the executed strategy was characterized by increased structure. Regularity of the short-term fluctuations in the EMG increased significantly with effort level. Both experimental conditions showed more structure in the phase of the EMG compared to the surrogate data.

CONCLUSIONS:

This increased structure in the EMG signal may represent a less random and more orderly recruited firing pattern during the pedaling task at higher effort levels.

PMID: 25380476

PAIN**Central sensitization in OA**

Eur J Pain. 2014 Nov;18(10):1367-75. doi: 10.1002/j.1532-2149.2014.499.x. Epub 2014 Apr 3.

Evidence for central sensitization in patients with osteoarthritis pain: A systematic literature review.

Lluch E¹, Torres R, Nijs J, Van Oosterwijck J.

Abstract

Hyperexcitability of the central nervous system (CNS) has been suggested to play an important role in the chronic pain experienced by osteoarthritis (OA) patients. A systematic review following PRISMA guidelines was performed to evaluate the existing evidence from the literature related to the presence of central sensitization (CS) in patients with OA. Electronic databases PubMed and Web of Science were searched to identify relevant articles using pre-defined keywords regarding CS and OA. Full-text clinical reports addressing studies of CS in human adults with chronic complaints due to osteoarthritis were included and screened for methodological quality by two independent reviewers. From the 40 articles that were initially eligible for methodological quality assessment, 36 articles achieved sufficient scores and therefore were discussed. The majority of these studies were case-control studies and addressed OA of the knee joint. Different subjective and objective parameters considered manifestations of CS, which have been previously reported in other chronic pain conditions such as whiplash or rheumatoid arthritis, were established in subjects with OA pain. Overall results suggest that, although peripheral mechanisms are involved in OA pain, hypersensitivity of the CNS plays a significant role in a subgroup of subjects within this population.

Although the majority of the literature provides evidence for the presence of CS in chronic OA pain, clinical identification and treatment of CS in OA is still in its infancy, and future studies with good methodological quality are necessary.

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FIBROMYALGIA**Men and women FM**

Clinical Journal of Pain:

Post Acceptance: October 17, 2014

doi: 10.1097/AJP.000000000000132

Original Article: PDF Only

Sex Differences in Psychological Response to Pain in Patients with Fibromyalgia Syndrome.

Racine, Mélanie PhD; Castarlenas, Elena MSc; de la Vega, Rocío MSc; Tomé-Pires, Catarina MSc; Solé, Ester MSc; Miró, Jordi PhD; Jensen, Mark P. PhD; Moulin, Dwight E. MD; Nielson, Warren R. PhD

Abstract

Objectives: To examine whether men and women with fibromyalgia syndrome (FMS) differ with respect to pain severity and functioning, pain-related beliefs, or pain-related coping. We hypothesized no significant sex differences in measures of pain and functioning, but that we would observe differences between men and women in how they view and how they cope with FMS-related pain.

Methods: 747 women and 48 men with FMS who attended a multidisciplinary treatment program completed the study measures. Analyses of covariance were used to examine sex differences in the study measures, with a P-value of ≤ 0.01 and at least a moderate effect size (Cohen's $d \geq 0.5$) required for a difference to be deemed statistically significant.

Results: Men and women did not differ on demographic measures except for their age, with the men in our sample being significantly younger than the women. Consistent with the study hypothesis, the results revealed no sex differences in the measures of pain and functioning. For pain-related beliefs, men were more likely to view pain as reflecting harm, and they were also more likely than women to use activity avoidance as a pain coping strategy.

Discussion: The study findings suggest that women and men with FMS may think about and cope with pain somewhat differently, and may therefore benefit from different types of psychosocial pain intervention.

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Antidepressants vs. placebo

J Pain. 2014 Oct 2. pii: S1526-5900(14)00938-9. doi: 10.1016/j.jpain.2014.09.011

Segregating the cerebral mechanisms of antidepressants and placebo in fibromyalgia.

Jensen KB1, Petzke F2, Carville S3, Choy E4, Fransson P5, Gracely RH6, Vitton O7, Marcus H8, Williams SC9, Ingvar M10, Kosek E10.

Abstract

Antidepressant drugs are commonly used to treat fibromyalgia but there is little knowledge about their mechanisms of action. The aim of this study was to compare the cerebral and behavioral response to positive treatment effects of antidepressants or placebo. Ninety-two fibromyalgia patients participated in a 12-week, double-blind, placebo-controlled, clinical trial with milnacipran; a noradrenalin-serotonin re-uptake inhibitor. Before and after treatment, measures of cerebral pain processing were obtained using functional magnetic resonance imaging. Also, there were stimulus-response assessments of pressure-pain, measures of weekly pain and fibromyalgia impact. Following treatment, milnacipran-responders exhibited significantly higher activity in the posterior cingulum, compared to placebo-responders. The mere exposure to milnacipran did not explain our findings since milnacipran-responders exhibited increased activity also in comparison to milnacipran non-responders. Stimulus-response assessments revealed specific antihyperalgesic effects in milnacipran-responders, which also correlated to reduced clinical pain and to increased activation of the posterior cingulum. A short history of pain predicted positive treatment response to milnacipran.

We report segregated neural mechanisms for positive responses to treatment with milnacipran and placebo, reflected in the posterior cingulum. The increase of pain-evoked activation in the posterior cingulum may reflect a normalization of altered default mode network processing; an alteration implicated in fibromyalgia pathophysiology.

PERSPECTIVE:

The present article presents neural and psychophysical correlates to positive treatment responses in patients with fibromyalgia, treated with either milnacipran or placebo. The comparison between placebo- and milnacipran-responders may shed light on the specific mechanisms involved in antidepressant treatment of chronic pain.

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KEYWORDS: Magnetic Resonance Imaging; antidepressive agents; fibromyalgia; milnacipran; placebos PMID: 25283470

NUTRITION/VITAMINS

Vit D and menopause

Markers of subclinical atherosclerosis in premenopausal women with vitamin D deficiency and effect of vitamin D replacement

Atherosclerosis, 10/29/2014 Clinical Article

Gurses KM, et al. –

This study aims to investigate the impact of vitamin D deficiency and replacement on markers of subclinical atherosclerosis in young premenopausal women in whom vitamin D deficiency is prevalent. This study demonstrates that endothelial function is impaired in otherwise healthy vitamin D deficient young premenopausal women and improves with 6-month replacement therapy. Immune-modulatory effects of vitamin D may, at least partly, be responsible for its beneficial effects on vascular health.

Methods

- Thirty-one premenopausal vitamin D deficient women and 27 age and gender-matched control subjects were enrolled in this study.
- Markers of subclinical atherosclerosis including carotid intima-media thickness (cIMT), flow-mediated dilatation (FMD), endothelial progenitor cell (EPC) count and cytokine levels were determined at baseline.
- All measurements were repeated at 6-month follow-up in vitamin D-deficient subjects after vitamin D replacement.

Results

- Vitamin D deficient premenopausal women had lower FMD (9.9 ± 1.3 vs. 13.8 ± 1.7 %, $p < 0.001$) and EPC counts at baseline.
- This population also had lower IL-10 and higher IL-17 levels.
- A 6-month vitamin D replacement therapy resulted in a significant increase in FMD (9.9 ± 1.3 vs. 11.4 ± 1.4 %, $p < 0.001$) and EPC counts.
- Furthermore, cytokine profile shifted toward a more anti-inflammatory phenotype including elevated IL-10 and decreased IL-17 levels.
- cIMT was not different between patient and control groups and did not change following vitamin D replacement.
- Change in 25(OH)D and IL-17 levels were independent predictors of the change in FMD measurements following vitamin D replacement.

Vit. D 3 insufficiency and OD

Knee Surg Sports Traumatol Arthrosc. 2014 Nov 5.

Is vitamin D insufficiency or deficiency related to the development of osteochondritis dissecans?

Bruns J¹, Werner M, Soyka M.

Abstract

PURPOSE:

The aetiology of osteochondritis dissecans is still unclear. The aim of this prospective pilot study was to analyse whether vitamin D insufficiency, or deficiency, might be a contributing etiological factor in the development of an OCD lesion.

METHODS:

The serum level of vitamin D3 in 23 consecutive patients (12 male and 11 female) suffering from a stage III, or stages III and IV, OCD lesion (mostly stage III) admitted for surgery was measured.

RESULTS:

The patients' mean age was 31.3 years and most of them already exhibited closed epiphyseal plates. In the majority of patients (18/23), a distinct vitamin D3 deficiency was found, two patients were vitamin D3-insufficient and, in three patients, the vitamin D3 level reached the lowest normal value.

CONCLUSION:

These first data show that a vitamin D3 deficiency rather than an insufficiency may be involved in the development of OCD lesions. Probably, with a vitamin D3 substitution, the development of an advanced OCD stage could be avoided. Further analyses, including morphological analyses regarding a possible osteomalacia, and examination of the PTH and other determinants of the bone metabolism, should be undertaken to either confirm or refute these data. LEVEL OF EVIDENCE: IV. PMID: 25371231

Root tea and inflammation

Int J Rheum Dis. 2014 Oct 28. doi: 10.1111/1756-185X.12477.

Effects of *Arctium lappa* L. (Burdock) root tea on inflammatory status and oxidative stress in patients with knee osteoarthritis.

Maghsoumi-Norouzabad L1, Alipoor B, Abed R, Eftekhari Sadat B, Mesgari-Abbasi M, Asghari Jafarabadi M.

AIM:

This study was designed to examine the effect of Burdock root tea on inflammatory markers and oxidative stress indicators in patients with knee osteoarthritis (OA).

METHODS:

Thirty-six patients (10 men and 26 women) aged 50-70 years old with knee osteoarthritis referred to the Physical Medicine and Rehabilitation Department of the Tabriz University of Medical Sciences Hospitals, were selected for the study and randomly divided into two groups. Anthropometric measurements, including height, weight and body mass index (BMI) were measured. For all individuals along the 42 days of study period, the same drug treatments, including two lots of 500 mg acetaminophen twice a day and one glucosamine 500 mg once a day, were considered. The intervention group received daily three cups of Burdock root tea (each cup containing 2 g/150 mL boiled water) half-hour after the meal. The control group received three cups containing 150 cc boiled water daily. We assessed inflammatory markers such as high sensitivity C-reactive protein (hs-CRP) and interleukin-6 (IL-6) and oxidative stress indicators such as total antioxidants capacity (TAC), glutathione peroxidase (GPX), superoxide dismutase (SOD) and thiobarbituric acid reactive substances before and after the intervention.

RESULTS:

The results showed that burdock root tea significantly decreased the levels of serum IL-6 ($P = 0.002$), hs-CRP ($P = 0.003$) and malondialdehyde ($P < 0.001$), while the levels of serum TAC ($P < 0.001$) and activities of SOD ($P = 0.009$) were significantly increased. GPX activities increased but not significantly.

CONCLUSIONS:

The results suggested that *Arctium lappa* L. root tea improves inflammatory status and oxidative stress in patients with knee osteoarthritis.

Milk intake and bone health

BMJ. 2014 Oct 28;349:g6015. doi: 10.1136/bmj.g6015.

Milk intake and risk of mortality and fractures in women and men: cohort studies.

Michaëlsson K¹, Wolk A², Langenskiöld S³, Basu S³, Warensjö Lemming E⁴, Melhus H⁵, Byberg L⁶.

Author information**Abstract****OBJECTIVE:**

To examine whether high milk consumption is associated with mortality and fractures in women and men.

DESIGN:

Cohort studies.

SETTING:

Three counties in central Sweden.

PARTICIPANTS:

Two large Swedish cohorts, one with 61 433 women (39-74 years at baseline 1987-90) and one with 45 339 men (45-79 years at baseline 1997), were administered food frequency questionnaires. The women responded to a second food frequency questionnaire in 1997.

MAIN OUTCOME MEASURE:

Multivariable survival models were applied to determine the association between milk consumption and time to mortality or fracture.

RESULTS:

During a mean follow-up of 20.1 years, 15 541 women died and 17 252 had a fracture, of whom 4259 had a hip fracture. In the male cohort with a mean follow-up of 11.2 years, 10 112 men died and 5066 had a fracture, with 1166 hip fracture cases. In women the adjusted mortality hazard ratio for three or more glasses of milk a day compared with less than one glass a day was 1.93 (95% confidence interval 1.80 to 2.06). For every glass of milk, the adjusted hazard ratio of all cause mortality was 1.15 (1.13 to 1.17) in women and 1.03 (1.01 to 1.04) in men. For every glass of milk in women no reduction was observed in fracture risk with higher milk consumption for any fracture (1.02, 1.00 to 1.04) or for hip fracture (1.09, 1.05 to 1.13). The corresponding adjusted hazard ratios in men were 1.01 (0.99 to 1.03) and 1.03 (0.99 to 1.07). In subsamples of two additional cohorts, one in males and one in females, a positive association was seen between milk intake and both urine 8-iso-PGF2 α (a biomarker of oxidative stress) and serum interleukin 6 (a main inflammatory biomarker).

CONCLUSIONS:

High milk intake was associated with higher mortality in one cohort of women and in another cohort of men, and with higher fracture incidence in women. Given the observational study designs with the inherent possibility of residual confounding and reverse causation phenomena, a cautious interpretation of the results is recommended.

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PMID: 25352269

NEUROLOGICAL CONDITIONS

Stroke gait

J Neuroeng Rehabil. 2014 Oct 24;11(1):148.

Changes in activation timing of knee and ankle extensors during gait are related to changes in heteronymous spinal pathways after stroke.

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Abstract

BACKGROUND:

Extensor synergy is often observed in the paretic leg of stroke patients. Extensor synergy consists of an abnormal stereotyped co-activation of the leg extensors as patients attempt to move. As a component of this synergy, the simultaneous activation of knee and ankle extensors in the paretic leg during stance often affects gait pattern after stroke. The mechanisms involved in extensor synergy are still unclear. The first objective of this study is to compare the co-activation of knee and ankle extensors during the stance phase of gait between stroke and healthy individuals. The second objective is to explore whether this co-activation is related to changes in heteronymous spinal modulations between quadriceps and soleus muscles on the paretic side in post-stroke individuals.

METHODS:

Thirteen stroke patients and ten healthy individuals participated in gait and heteronymous spinal modulation evaluations. Co-activation was measured using peak EMG activation intervals (PAI) and co-activation amplitude indexes (CAI) between knee and ankle extensors during the stance phase of gait in both groups. The evaluation of heteronymous spinal modulations was performed on the paretic leg in stroke participants and on one leg in healthy participants. This evaluation involved assessing the early facilitation and later inhibition of soleus voluntary EMG induced by femoral nerve stimulation.

RESULTS:

All PAI were lower and most CAI were higher on the paretic side of stroke participants compared with the co-activation indexes among control participants. CAI and PAI were moderately correlated with increased heteronymous facilitation of soleus on the paretic side in stroke individuals.

CONCLUSIONS:

Increased co-activation of knee and ankle extensors during gait is related to changes in intersegmental facilitative pathways linking quadriceps to soleus on the paretic side in stroke individuals. Malfunction of intersegmental pathways could contribute to abnormal timing of leg extensors during the stance phase of gait in hemiparetic individuals.