

ABSTRACTS

LUMBAR SPINE

PELVIC GIRDLE

VISCERA

THORACIC SPINE

CERVICAL SPINE

CRANIUM/TMJ

HEADACHES

CONCUSSIONS

SHOULDER GIRDLE

GLENOHUMERAL/SHOULDER

ELBOW

WRIST AND HAND

HIP

KNEE

FOOT AND ANKLE

MANUAL THERAPY

STM/STRETCHING/MUSCLES

BET

ATHLETICS

RUNNING GAIT

PAIN

COMPLEX REGIONAL PAIN

FIBROMYALGIA

NUTRITION/VITAMINS/MEDICATION/TOPICALS

NEUROLOGICAL CONDITIONS

LBP

First incidence of LBP

Spine J. 2014 Oct 1; Epub 2014 Jan 23.

Incidence and risk factors for first-time incident low back pain: a systematic review and meta-analysis.

Taylor JB¹, Goode AP², George SZ³, Cook CE⁴.

Abstract

BACKGROUND CONTEXT:

Great effort has been made toward limiting low back pain (LBP). Recent focus has included factors involved with secondary and tertiary prevention, with less attention given to primary prevention.

PURPOSE:

This review provided a current estimate of the incidence of LBP and risk factors associated with either first-time LBP or transition to LBP from a baseline of a pain-free state.

PATIENT SAMPLE:

Studies included subjects aged 18 years or older, from longitudinal, observational, cohort designs that included baseline risk factors to an outcome of either first-time LBP or transition to LBP from a baseline of a pain-free state.

METHODS:

Electronic search strategies in PubMed, CINAHL/SPORTDiscus, and Cochrane Central Register of Controlled Trials were combined with a hand search to identify articles for inclusion. Studies were classified based on the population studied (community vs. occupational based) and type of LBP outcome (first ever vs. transition from a baseline pain-free state).

RESULTS:

A total of 41 studies were included for review. Meta-analytical incidence rates for first-time LBP

and transition to pain from a pain-free state were similar (~25%), regardless of community or

occupational populations. Risk factors for first-time LBP or transition to LBP from a baseline of a pain-free state were psychosocial and physically related. No consistent risk factor emerged as predictive of first-time LBP, although prior LBP was a consistent predictor of future incident LBP. Significant heterogeneity was found across studies in most models, which limits these findings.

CONCLUSIONS:

The results of this study suggest that incidence of LBP is similar in community and occupational settings regardless of LBP definition. There were multiple diverse physical and psychosocial risk factors for first-time LBP. A history of LBP was the most consistent risk factor for transition to LBP from a baseline of a pain-free state.

KEYWORDS: Incidence; Low back pain; Predictive validity; Prevention; Reccurence; Risk factors

PMID: 24462537

Disc surgery and PT

Clin Rehabil. 2014 Oct 6.

Twelve-year follow-up of a randomized controlled trial of comprehensive physiotherapy following disc herniation operation.

Ebenbichler G¹, Inschlag S², Pflüger V³, Stemberger R³, Wiesinger G⁴, Novak K⁵, Christoph K⁶, Resch KL⁷.

Abstract**OBJECTIVE:**

To evaluate the long-term effects of postoperative comprehensive physiotherapy starting one week after lumbar disc surgery.

DESIGN:

Twelve-year follow-up of a three-armed, randomized, controlled, single-blinded clinical trial.

SETTING:

Department of Physical Medicine & Rehabilitation.

PARTICIPANTS:

Of 111 patients following first-time, uncomplicated lumbar disc surgery who participated in the original study and completed the treatment originally allocated, 74 ((67%; 29 (73%) physiotherapy, 22 (58%) sham therapy, 23 (68%) no therapy) completed a 12-year follow-up examination.

INTERVENTIONS:

In the original study, patients had been randomly assigned to comprehensive physiotherapy, sham intervention (neck massage), or no therapy.

MEASURES:

Low Back Pain Rating Scale; best score 0, worst score 130 points).

RESULTS:

At 12 years after surgery, the group participating in comprehensive physiotherapy had significantly better functional outcomes, as rated on the Low Back Pain Rating Score, than the untreated group (mean difference: -13.2 (95% CI: (-25.4; -1.0)). Equally, there was a clinically relevant, non-significant difference between the sham therapy and no therapy (mean difference: -12.5 (95%CI: -26.1; 1.1)). Consequently, the Low Back Pain Rating Score outcome did not differ between physiotherapy and sham therapy (mean difference: -0.7 (95%CI: -14.2; 12.8)).

CONCLUSIONS:

Participating in a comprehensive physiotherapy program following lumbar disc surgery may be associated with better long-term health benefits over no intervention, but may not be superior to sham therapy.

KEYWORDS: Disc herniation surgery; exercise therapy; long-term outcome; physiotherapy; randomized

PMID: 25288048

Cold hyperalgesia

Clin J Pain. 2014 Oct;30

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

Non-medical treatment

Pain Manag Nurs. 2014 Jun;15, Epub 2012 Apr 11.

Nonmedical methods to relieve low back pain caused by lumbar disc herniation: a descriptive study in northeastern Turkey.

Cilingir D¹, Hintistan S², Yigitbas C³, Nural N².

Abstract

Purpose: Low back pain due to the effects of lumbar disc herniation is a common complaint of patients who often subsequently seek help from medical professionals. It is also a significant health problem which is quite difficult to treat. This descriptive study was conducted to determine nonmedical methods used by patients with lumbar disc herniation to relieve low back pain; the patients' intensity of low back pain when they were admitted to the hospital was also explored.

Methods: Ninety-two patients with lumbar disc herniation participated in this study, which was carried out at a university hospital in northeastern Turkey. Data were collected using a patient information form and the visual analog scale (VAS).

Results: When the patients were admitted to hospital, their mean VAS score was 6.56 ± 2.45 . The study results showed that as a first choice nearly all of the patients (94.6%) with lumbar disc herniation preferred consulting with their physicians before to obtain relief for low back pain. However, in addition to seeing their physician, more than one-half of these patients (57.6%) also used nonmedical methods. The primary nonmedical methods were hot/cold compresses, wrapping various substances on the back, and herbal preparations. An increase in pain was noted by 17.0% of patients after using nonmedical methods.

Conclusions: Findings indicated that more than two-thirds of patients experienced either no change or an increase in pain after using nonmedical methods to find relief.

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PMID: 24882024

DISC

Weightlifters and Disc degeneration

Spine (Phila Pa 1976). 2014 Oct 15.

Early intervertebral disc degeneration changes in asymptomatic weightlifters assessed by T1ρ-magnetic resonance imaging.

Vadalà G¹, Russo F, Battisti S, Stellato L, Martina F, Del Vescovo R, Giacalone A, Borthakur A, Zobel BB, Denaro V.

Abstract

STUDY DESIGN:

Case-control study.

OBJECTIVE:

To evaluate early intervertebral disc degeneration quantified by T1ρ- and T2-weighted magnetic resonance imaging (MRI) in asymptomatic weightlifters compared with a healthy control group matched for sex and age.

SUMMARY OF BACKGROUND DATA:

Athletes consistently recruit or transfer high levels of repetitive forces through the spine, and MRI has documented a higher rate of intervertebral disc degeneration in athletes compared with matched controls. This study aims to analyze the potential role of T1ρ-MRI in the assessment of early degenerative changes occurring in intervertebral discs of young asymptomatic weightlifters compared with healthy controls.

METHODS:

Twenty-six asymptomatic young male weightlifters versus a sedentary control group matched for age and sex, both having no lower back pain nor any spinal symptoms, underwent MRI (1.5 T). Degenerative grade was assessed using T2-weighted images, according to the Pfirrmann scale. T1ρ mapping and values in the nucleus pulposus (n = 130) were obtained. Differences in T1ρ value between among the groups and linear regression analyses with degenerative grade were determined.

RESULTS:

Pfirrmann degenerative grade did not show significant differences among groups. Instead, T1ρ values were significantly lower in the lumbar spine of weightlifters compared with controls (P < 0.05). T1ρ values decreased linearly with degenerative grade.

CONCLUSION:

T1ρ values were significantly lower in athletes compared with a sedentary matched control group showing differences in intervertebral disc degeneration onset among individuals with lifestyle and environmental factors leading to back pain. T1ρ can be potentially used as a valid clinical tool to identify early changes in intervertebral disc on the verge of new emerging intervertebral discs regenerative strategies and treatments.

PMID: 25099319

INJECTIONS

Injections with radicular symptoms

BMC Musculoskelet Disord. 2014 Oct 11

Steroid injections added to the usual treatment of lumbar radicular syndrome: a pragmatic randomized controlled trial in general practice.

Spijker-Huiges A, Winters JC, van Wijhe M, Groenier K.

Abstract

BACKGROUND:

Lumbosacral radicular syndrome (LRS) is a self-limiting, benign, painful and impairing condition caused by lumbar disc herniation and inflammatory processes around the nerve root. Segmental epidural steroid injections (SESI) are helpful to reduce radicular pain on a short-term basis. It is unknown whether SESIs are an effective addition to usual pain treatment of LRS in general practice. In our study, we assessed the effectiveness of SESIs on pain and disability as an addition to usual care for acute LRS in general practice.

METHODS:

A pragmatic, single-blinded, randomized controlled trial in Dutch general practice was conducted. Circumstances of daily practice were closely followed. Care as usual (CAU) was compared to care as usual combined with an additional SESI in 63 patients in the acute phase of LRS. To detect a minimal clinically important difference of 1.2 points on a numerical rating scale for back pain and a common within-group standard deviation of 1.7 with a two-tailed alpha of 0.05 and a power of 0.80, we needed 33 subjects in each group. Statistical analysis was carried out using mixed models.

RESULTS:

A small significant effect in favour of the intervention, corrected for age, sex and baseline values, was found for back pain, impairment and Roland-Morris disability score. The differences, though statistically significant, were too small to be considered clinically relevant. Patients from the intervention group were significantly more satisfied with the received treatment than patients from the control group.

CONCLUSION:

We found a small, statistically significant, but not clinically relevant positive effect of SESIs on back pain, impairment and disability in acute LRS. We do not recommend implementing SESIs as an additional regular treatment option in general practice.

PMID: 2530493

VISCERA

Abdominal pain

Aliment Pharmacol Ther. 2014 Oct 1.

Allergy-related diseases and recurrent abdominal pain during childhood - a birth cohort study.

Olén O¹, Neuman A, Koopmann B, Ludvigsson JF, Ballardini N, Westman M, Melén E, Kull I, Simrén M, Bergström A.

Abstract

BACKGROUND:

Allergy and immune dysregulation may have a role in the pathophysiology of recurrent abdominal pain of functional origin, but previous studies of allergy-related diseases and abdominal pain have contradictory results.

AIM:

To examine the association between allergy-related diseases or sensitisation during childhood and abdominal pain at age 12 years.

METHODS:

In this birth cohort study of 4089 children, parents answered questionnaires regarding asthma, allergic rhinitis, eczema and food hypersensitivity ('allergy-related diseases') at ages 0,1,2,4,8 and 12 years. Blood for analyses of allergen-specific IgE was sampled at 4 and 8 years. At 12 years, the children answered questions regarding abdominal pain. Children with coeliac disease or inflammatory bowel disease were excluded. Associations were examined using multivariable logistic regression.

RESULTS:

Among 2610 children with complete follow-up, 9% (n = 237) reported abdominal pain at 12 years. All allergy-related diseases were associated with concurrent abdominal pain at 12 years and the risk increased with increasing number of allergy-related diseases (P for trend <0.001). Asthma at 1 and 2 years and food hypersensitivity at 8 years were significantly associated with abdominal pain at 12 years. There was an increased risk of abdominal pain at 12 years in children sensitised to food allergens at 4 or 8 years, but in stratified analyses, this was confined to children whose parents had not reported food hypersensitivity at time of sensitisation.

CONCLUSION:

Allergy-related diseases as well as sensitisation to food allergens were associated with an elevated risk of abdominal pain, and the risk increased with the number of allergy-related diseases.

PMID: 25270840

Dysmenorrhoea

Women with dysmenorrhoea are hypersensitive to experimentally induced forearm ischaemia during painful menstruation and during the pain-free follicular phase

European Journal of Pain, 10/16/2014 Clinical Article, Iacovides S, et al.

Purpose: The authors aimed to investigate whether women with dysmenorrhoea, compared with controls, have increased sensitivity to experimentally induced deep-tissue muscle ischaemia in a body area distant from that of referred menstrual pain. The data show that compared with controls, women who experience severe recurrent dysmenorrhoea have deep-tissue hyperalgesia to ischaemic pain in muscles outside of the referred area of menstrual pain both during the painful menstruation phase and pain-free follicular phase.

Methods

- The sub-maximal effort tourniquet test was used to induce forearm ischaemia in 11 women with severe dysmenorrhoea and in nine control women both during menstruation and in the follicular phase of the menstrual cycle.
- Von Frey hair assessments confirmed the presence of experimental ischaemia.
- Women rated the intensity of menstrual and ischaemic pain on a 100-mm visual analogue scale.

Results

- Women with dysmenorrhoea [mean (SD): 68 (20) mm] reported significantly greater menstrual pain compared with controls [mean (SD): 2 (6) mm; $p=0.0001$] during the menstruation phase.
- They also rated their forearm ischaemic pain as significantly greater than the controls during the menstruation [dysmenorrhoeics vs. controls mean (SD): 58 (19) mm vs. 31 (21) mm, $p<0.01$] and follicular [dysmenorrhoeics vs. controls mean (SD): 60 (18) mm vs. 40 (14) mm, $p<0.01$] phases of the menstrual cycle.

CERVICAL SPINE

C spine pain and scapular correction

J Manipulative Physiol Ther. 2014 Oct 1

Immediate Effects of Active Versus Passive Scapular Correction on Pain and Pressure Pain Threshold in Patients With Chronic Neck Pain.

Lluch E¹, Arguisuelas MD², Calvente Quesada O³, Martínez Noguera E², Peiró Puchades M², Pérez Rodríguez JA², Falla D⁴.

Abstract

OBJECTIVE:

The purpose of this study was to investigate the effect of active vs passive scapular correction on pain and pressure pain threshold at the most symptomatic cervical segment in patients with chronic neck pain.

METHODS:

Twenty-three volunteers with chronic, idiopathic neck pain were recruited (age, 38.9 ± 14.4 years; sex [man/woman], 3/20; Neck Disability Index, $28.1\% \pm 9.9\%$). Subjects were randomly allocated to 2 groups: active scapular correction or passive scapular correction. Pressure pain threshold and pain intensity rated on a numerical rating scale during a posteroanterior glide over the most symptomatic cervical segment were measured before and immediately after the active or passive scapular intervention.

RESULTS:

Only the active scapular correction produced a reduction in pain (pre, 6.3 ± 1.2 ; post, 3.7 ± 2.4 ; $P < .05$) and increase in pressure pain threshold (pre, 8.7 ± 4.2 kg/cm²; post, 10.1 ± 3.8 kg/cm²; $P < .05$) at the most painful cervical segment.

CONCLUSIONS:

An active scapular correction exercise resulted in an immediate reduction of pain and pressure pain sensitivity in patients with chronic neck pain and scapular dysfunction.

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KEYWORDS:

Exercise; Intervention; Neck Pain; Randomized Trial; Scapula

PMID: 2528267

Fusion vs. disc replacement

Cost-effectiveness of cervical total disc replacement vs fusion for the treatment of 2-level symptomatic degenerative disc disease

JAMA Surgery, 10/17/2014 Clinical Article

Ament JD, et al.

Importance Cervical total disc replacement (CTDR) was developed to treat cervical spondylosis, while preserving motion. While anterior cervical discectomy and fusion (ACDF) has been the standard of care for 2-level disease, a randomized clinical trial (RCT) suggested similar outcomes. Cost-effectiveness of this intervention has never been elucidated.

Objective To determine the cost-effectiveness of CTDR compared with ACDF.

Design, Setting, and Participants Data were derived from an RCT that followed up 330 patients over 24 months. The original RCT consisted of multi-institutional data including private and academic institutions. Using linear regression for the current study, health states were constructed based on the stratification of the Neck Disability Index and a visual analog scale. Data from the 12-item Short-Form Health Survey questionnaires were transformed into utilities values using the SF-6D mapping algorithm. Costs were calculated by extracting Diagnosis-Related Group codes from institutional billing data and then applying 2012 Medicare reimbursement rates. The costs of complications and return-to-work data were also calculated. A Markov model was built to evaluate quality-adjusted life-years (QALYs) for both treatment groups. The model adopted a third-party payer perspective and applied a 3% annual discount rate. Patients included in the original RCT had to be diagnosed as having radiculopathy or myeloradiculopathy at 2 contiguous levels from C3-C7 that was unresponsive to conservative treatment for at least 6 weeks or demonstrated progressive symptoms.

Main Outcomes and Measures Incremental cost-effectiveness ratio of CTDR compared with ACDF.

Results A strong correlation ($R^2 = 0.6864$; $P < .001$) was found by projecting a visual analog scale onto the Neck Disability Index. Cervical total disc replacement had an average of 1.58 QALYs after 24 months compared with 1.50 QALYs for ACDF recipients. Cervical total disc replacement was associated with \$2139 greater average cost. The incremental cost-effectiveness ratio of CTDR compared with ACDF was \$24 594 per QALY at 2 years. Despite varying input parameters in the sensitivity analysis, the incremental cost-effectiveness ratio value stays below the threshold of \$50 000 per QALY in most scenarios (range, -\$58 194 to \$147 862 per QALY).

Conclusions and Relevance The incremental cost-effectiveness ratio of CTDR compared with traditional ACDF is lower than the commonly accepted threshold of \$50 000 per QALY. This remains true with varying input parameters in a robust sensitivity analysis, reaffirming the stability of the model and the sustainability of this intervention.

HEADACHES

Sleep and central sensitization

J Headache Pain. 2014 Sep 26

Sleep features and central sensitization symptoms in primary headache patients.

de Tommaso M¹, Delussi M, Vecchio E, Sciruicchio V, Invitto S, Livrea P.

Abstract

BACKGROUND:

Association between sleep disorders and headache is largely known. The aim of the present study was to evaluate sleep quality and quantity in a large cohort of primary headache patients, in order to correlate these scores with symptoms of central sensitization as allodynia, pericranial tenderness and comorbidity with diffuse muscle-skeletal pain.

METHODS:

One thousand six hundreds and seventy primary headache out patients were submitted to the Medical Outcomes Study (MOS) within a clinical assessment, consisting of evaluation of frequency of headache, pericranial tenderness, allodynia and coexistence of fibromyalgia syndrome (FM).

RESULTS:

Ten groups of primary headache patients were individuated, including patients with episodic and chronic migraine and tension type headache, mixed forms, cluster headache and other trigeminal autonomic cephalalgias. Duration but not sleep disturbances score was correlated with symptoms of central sensitization as allodynia and pericranial tenderness in primary headache patients. The association among allodynia, pericranial tenderness and short sleep characterized chronic migraine more than any other primary headache form. Patients presenting with FM comorbidity suffered from sleep disturbances in addition to reduction of sleep duration.

CONCLUSION:

Self reported duration of sleep seems a useful index to be correlated with allodynia, pericranial tenderness and chronic headache as a therapeutic target to be assessed in forthcoming studies aiming to prevent central sensitization symptoms development.

PMID: 25260261

Cognitive adaptations and HA

Cephalalgia. 2014 Oct 10.

Low cognitive reserve is associated with chronic migraine with medication overuse and poor quality of life.

Gómez-Beldarrain M¹, Anton-Ladislao A², Aguirre-Larracochea U², Oroz I³, García-Moncó JC³.

Abstract**OBJECTIVE:**

The objective of this article is to test the hypothesis that cognitive reserve (CR) is related to migraine chronification, medication overuse and poor quality of life in migraineurs.

DESIGN/METHODS:

A cross-sectional study on patients with chronic migraine with medication overuse (CM-MOH), episodic migraine (EM), and controls, matched by sex, age and education, was carried out. CR was assessed by a specific questionnaire, and quality of life was measured by general and specific questionnaires (SF-36 and MSQoL). Migraine Disability Assessment Scale and Beck questionnaires for depression and anxiety were used. Medication dependence was evaluated by the medication-dependence questionnaire in headache (MDQ-H).

RESULTS:

Fifty-five individuals were enrolled: 18 CM-MOH patients (32.73%), 22 EM patients (40%) and 15 controls (27.27%). Fifty (90.91%) of them were females and aged 43.53 (7.54) years. Univariate analysis showed a significant association between the study group and CR, and all items of the SF-36, anxiety and depression questionnaires, MSQoL and MDQ-H. The lower CR and CM-MOH group were related to a worse quality of life, more anxiety and depression and the highest medication dependence scores. Multivariate analysis showed that higher CR scores were related to higher quality of life as measured by the physical and mental composite scores of the SF-36, and to lower anxiety (beta = -1.08, p = 0.001) and depression (beta = -0.56, p = 0.03) levels. Focusing on MSQoL, the increase in CR was predictive of a better quality of life (beta = 1.88, p < 0.0001). By all the models, the explained variance of the sample ranged from 39% (mental composite score) to 58% (MSQoL).

CONCLUSIONS:

Low CR appears to be an independent factor associated with the deterioration of quality of life, the presence of anxiety and depression, and drug dependence and medication overuse in CM-MOH.

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KEYWORDS:

Cognitive reserve; chronic migraine with medication overuse; quality of life

PMID: 25304767

White matter changes

Changes of migraine-related white matter hyperintensities after 3 years: a longitudinal MRI study

Headache: The Journal of Head and Face Pain, 10/17/2014 Clinical Article

Erdélyi–Bótor S, et al.

Purpose: The aim of this longitudinal study was to investigate changes of migraine-related brain white matter hyperintensities 3 years after an initial study. This longitudinal MRI study found clinically silent brain white matter hyperintensities to be predominantly progressive in nature. The absence of a control group precludes definitive conclusions about the nature of these changes or if their degree is beyond normal aging.

Methods

- The same patient group was reinvestigated in 2012 using the same MRI scanner and acquisition protocol.
- MR measurements were performed on a 3.0-Tesla clinical MRI scanner.
- Beyond the routine T1-, T2-weighted, and fluid-attenuated inversion recovery imaging, diffusion and perfusion-weighted imaging, proton magnetic resonance spectroscopy, and T1 and T2 relaxation time measurements were also performed.
- Findings of the baseline and follow-up studies were compared with each other.

Results

- The follow-up proton magnetic resonance spectroscopy studies of white matter hyperintensities showed significantly decreased N-acetyl-aspartate (median values 8.133 vs 7.153 mmol/L, $P=.009$) and creatine/phosphocreatine (median values 4.970 vs 4.641 mmol/L, $P=.015$) concentrations compared to the baseline, indicating a more severe axonal loss and glial hypocellularity with decreased intracellular energy production.
- The diffusion values, the T1 and T2 relaxation times, and the cerebral blood flow and volume measurements presented only mild changes between the studies.
- The number (median values 21 vs 25, $P<.001$) and volume (median values 0.896 vs 1.140 nmL, $P<.001$) of hyperintensities were significantly higher in the follow-up study.
- No changes were found in the hemispheric and lobar distribution of hyperintensities.
- An increase in the hyperintensity size of preexisting lesions was much more common than a decrease (median values 14 vs 5, $P=.004$).
- A higher number of newly developed hyperintensities were detected than disappeared ones (130 vs 22), and most of them were small ($<.034$ mL).
- Small white matter hyperintensities in patients with a low migraine attack frequency had a higher chance to disappear than large white matter hyperintensities or white matter hyperintensities in patients with a high attack frequency (coefficient: -0.517 , $P=.034$).

Parental history and HA

Cephalalgia. 2014 Oct 10.

Association of age at onset of migraine with family history of migraine in children attending a pediatric headache clinic: A retrospective cohort study.

Eidlitz-Markus T¹, Haimi-Cohen Y², Zeharia A².

Abstract

AIM:

Migraine is known to run in families and has long been considered a strongly heritable disorder. This study sought to evaluate the relationship between age at onset of pediatric migraine and family history of migraine.

METHODS:

Review of the medical files of the headache clinic of a tertiary pediatric medical center yielded 344 children with migraine for whom details on migraine in family members were available.

RESULTS:

Mean age of the cohort was 11.69 ± 3.49 years, and mean frequency of headache per month, 13.68 ± 11.26 . Mean age at migraine onset in patients with a negative parental history was 10.48 ± 3.39 years; in patients with one parent with migraine, 8.84 ± 3.72 years; and in patients with both parents with migraine, 7.32 ± 3.22 years ($p < 0.001$). The duration of migraine attacks (in hours) was significantly longer in patients with any family member with migraine than in those with no family history ($p = 0.026$).

CONCLUSIONS:

Among children attending a tertiary pediatric headache clinic, migraine appears at a younger age in those with parental history of migraine than in those with a negative family history. The findings suggest that having a genetic background of migraine makes a child more susceptible to migraine earlier in life than a child without a family history.

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KEYWORDS:

Pediatric; age; migraine onset; parental migraine

PMID: 25304765

CONCUSSIONS

Football helmets

Am J Sports Med. 2014 Oct; Epub 2014 Jul 24.

Protective equipment and player characteristics associated with the incidence of sport-related concussion in high school football players: a multifactorial prospective study.

McGuine TA¹, Hetzel S², McCrea M³, Brooks MA⁴.

Abstract

BACKGROUND:

The incidence of sport-related concussion (SRC) in high school football is well documented. However, limited prospective data are available regarding how player characteristics and protective equipment affect the incidence of SRC.

PURPOSE:

To determine whether the type of protective equipment (helmet and mouth guard) and player characteristics affect the incidence of SRC in high school football players.

METHODS:

Certified athletic trainers (ATs) at each high school recorded the type of helmet worn (brand, model, purchase year, and recondition status) by each player as well as information regarding players' demographics, type of mouth guard used, and history of SRC. The ATs also recorded the incidence and days lost from participation for each SRC. Incidence of SRC was compared for various helmets, type of mouth guard, history of SRC, and player demographics.

RESULTS:

A total of 2081 players (grades 9-12) enrolled during the 2012 and/or 2013 football seasons (2287 player-seasons) and participated in 134,437 football (practice or competition) exposures. Of these players, 206 (9%) sustained a total of 211 SRCs (1.56/1000 exposures). There was no difference in the incidence of SRC (number of helmets, % SRC [95% CI]) for players wearing Riddell (1171, 9.1% [7.6%-11.0%]), Schutt (680, 8.7% [6.7%-11.1%]), or Xenith (436, 9.2% [6.7%-12.4%]) helmets. Helmet age and recondition status did not affect the incidence of SRC. The rate of SRC (hazard ratio [HR]) was higher in players who wore a custom mouth guard (HR = 1.69 [95% CI, 1.20-2.37], $P < .001$) than in players who wore a generic mouth guard. The rate of SRC was also higher (HR = 1.96 [95% CI, 1.40-2.73], $P < .001$) in players who had sustained an SRC within the previous 12 months (15.1% of the 259 players [95% CI, 11.0%-20.1%]) than in players without a previous SRC (8.2% of the 2028 players [95% CI, 7.1%-9.5%]).

CONCLUSION:

Incidence of SRC was similar regardless of the helmet brand (manufacturer) worn by high school football players. Players who had sustained an SRC within the previous 12 months were more likely to sustain an SRC than were players without a history of SRC. Sports medicine providers who work with high school football players need to realize that factors other than the type of protective equipment worn affect the risk of SRC in high school players.

ROTATOR CUFF

Platelet rich injections

Am J Sports Med. 2014 Oct. Epub 2014 Aug 1.

Platelet-rich plasma in rotator cuff repair: a prospective randomized study.

Malavolta EA¹, Gracitelli ME², Ferreira Neto AA², Assunção JH², Bordalo-Rodrigues M³, de Camargo OP⁴.

Abstract

BACKGROUND:

Although platelet-rich plasma (PRP) has been used in rotator cuff repair, most authors have been unable to report the advantages of this method in clinical trials.

HYPOTHESIS:

The use of PRP promotes better functional and structural results in arthroscopic rotator cuff repair.

METHODS:

This was a prospective, randomized, double-blind study with 2 groups of 27 patients each (PRP group and control group). Complete supraspinatus tears with retraction of less than 3 cm were subjected to arthroscopic single-row repair; at the end of the surgical procedure, liquid PRP prepared by apheresis was given to the patients in the PRP group with autologous thrombin. The outcomes were assessed by the University of California at Los Angeles (UCLA) and Constant scales, visual analog scale (VAS) for pain, and magnetic resonance imaging (MRI) before and 3, 6, 12, and 24 months after surgery. The significance level was 5%.

RESULTS:

The 2 groups of patients exhibited significant clinical improvement ($P < .001$). Between the preoperative assessment and 24-month follow-up, the mean UCLA score increased from 13.63 ± 3.639 to 32.70 ± 3.635 and from 13.93 ± 4.649 to 32.44 ± 4.318 in the control and PRP groups, respectively ($P = .916$). The mean Constant score increased from 47.37 ± 11.088 to 85.15 ± 9.879 in the control group and from 46.96 ± 11.937 to 84.78 ± 14.048 in the PRP group ($P = .498$). The mean VAS score varied from 7.00 ± 1.939 and 6.67 ± 1.617 before surgery to 1.15 ± 1.916 and 0.96 ± 2.244 at the 24-month assessment in the control and PRP groups, respectively ($P = .418$). The only difference was in the mean UCLA score at 12 months, with 30.04 ± 4.528 in the control group and 32.30 ± 3.506 in the PRP group ($P = .046$). The control group exhibited 1 case of a complete retear and 4 partial retears, and the PRP group exhibited 2 cases of partial retears ($P = .42$).

CONCLUSION:

Platelet-rich plasma prepared by apheresis and applied in the liquid state with thrombin did not promote better clinical results at 24-month follow-up. Given the numbers available for analysis, the retear rate also did not change.

IMPINGEMENT

Manual vs. exercise

J Rehabil Med. 2014 Sep 11.

Effectiveness of physiotherapy and costs in patients with clinical signs of shoulder impingement syndrome: One year follow-up of a randomized controlled trial.

Kromer TO¹, de Bie RA, Bastiaenen CH.

Abstract

Objectives: To investigate the effect of manual physiotherapy and exercises compared with exercises alone in patients with shoulder impingement syndrome one year after inclusion. Design: Randomized controlled trial. Subjects: Patients with shoulder impingement of more than 4 weeks.

Methods: The intervention group received individualized manual physiotherapy plus individualized exercises; the control group received individualized exercises only. Both groups had 10 treatments over 5 weeks; afterwards all patients continued their exercises for another 7 weeks at home. Primary outcomes were the Shoulder Pain and Disability Index and Patients' Global Impression of Change. The Generic Patient-Specific Scale was used as secondary outcome. Costs were recorded in a log-book.

Results: Ninety patients were included in the study and 87 could be analyzed at 1-year follow-up. Both groups showed significant improvements in all outcome measures, but no difference was detected between the groups. Only costs differed significantly in favour of the control group ($p = 0.03$) after 5 weeks.

Conclusion: Individualized exercises resulted in lower costs than manual physiotherapy and showed a significant effect on pain and functioning within the whole group after one year. Exercises should therefore be considered as a basic treatment. Due to the progressive improvement that occurred during the follow-up period with individualized exercises further treatments should be delayed for 3 to 4 months.

PMID: 25211291

ELBOW**Olecranon bursitis**

Arch Orthop Trauma Surg. 2014 Sep 19.

Treatment of olecranon bursitis: a systematic review.

Sayegh ET¹, Strauch RJ.

Abstract**INTRODUCTION:**

The optimal management of olecranon bursitis is ill-defined. The purposes of this review were to systematically evaluate clinical outcomes for aseptic versus septic bursitis, compare surgical versus nonsurgical management, and examine the roles of corticosteroid injection and aspiration in aseptic bursitis.

MATERIALS AND METHODS:

The English-language literature was searched using PubMed, Cumulative Index to Nursing and Allied Health Literature, Physiotherapy Evidence Database, Allied and Complementary Medicine, and Cochrane Central Register of Controlled Trials. Analyses were performed for clinical resolution and complications after treatment of aseptic and/or septic olecranon bursitis.

RESULTS:

Twenty-nine studies containing 1278 patients were included. Compared with septic bursitis, aseptic bursitis was associated with a significantly higher overall complication rate ($p = 0.0108$). Surgical management was less likely to clinically resolve septic or aseptic bursitis ($p = 0.0476$), and demonstrated higher rates of overall complications ($p = 0.0117$), persistent drainage ($p = 0.0194$), and bursal infection ($p = 0.0060$) than nonsurgical management. Corticosteroid injection for aseptic bursitis was associated with increased overall complications ($p = 0.0458$) and skin atrophy ($p = 0.0261$). Aspiration did not increase the risk of bursal infection for aseptic bursitis.

CONCLUSIONS:

Based primarily on level IV evidence, nonsurgical management of olecranon bursitis is significantly more effective and safer than surgical management. The clinical course of aseptic bursitis appears to be more complicated than that of septic bursitis. Corticosteroid injection is associated with significant risks without improving the outcome of aseptic bursitis.

LEVEL OF EVIDENCE:

Therapeutic IV.

PMID: 25234151

HIP**Hunter's Canal**

Phlebology. 2014 Sep 10.

Anatomy of the Hunter's canal and its role in the venous outlet syndrome of the lower limb.

Uhl J¹, Gillot C².

Abstract**BACKGROUND:**

The "Adductor canal syndrome" has been described as an unusual cause of acute arterial occlusion inside the Hunter's canal in young sportsmen. It may also produce a compressive neuropathy of the saphenous nerve. To our knowledge, femoral vein compression in the canal has never been reported.

OBJECTIVE:

To describe the anatomy, to propose a physiology of this canal, and to show that the femoral vein is much more exposed than the artery to compression inside this adductor hiatus, particularly at the outlet.

MATERIAL AND METHODS:

The whole adductor canal was exposed in 100 limbs for anatomical study following latex injection. A series of 200 phlebographies and 100 CT venograms were also analyzed.

RESULTS:

Anatomically, we found a musculotendinous band called the "vastoadductor membrane," which jointed the adductor tendon to the vastus medialis in all the cases. The femoral vein, located more posteriorly, was frequently narrowed at this level. This band can create a notch with a venous stenosis at the outlet of the Hunter's canal, usually located 12-14 cm above the femoral condyle. Two femoral valves constitute the landmark of the canal on the venograms: the lower is just below the outlet, 9 cm above the condyle. The second valve is 3 cm higher inside the canal. Functionally, the cadaveric simulations showed that the contraction of the adductor longus closes the hiatus, while the adductor magnus opens it. Our hypothesis is that Hunter's canal prevents femoropopliteal axis reflux by synchronizing with calf pump ejection during ambulation.

CONCLUSION:

Compression of the femoral vein inside the adductor's canal is an underestimated and misdiagnosed cause of postural stenosis of the femoral vein. Ultrasound investigation of both limbs in patients with chronic venous disease (CVD) should be systematically carried out at this precise level in order to prevent future occlusion and onset of acute deep vein thrombosis.

KEYWORDS:

Hunter's canal; Venous; adductor canal; anatomy; deep vein thrombosis (DVT) prevention; femoral vein obstruction

PMID: 25209386

OA IMPINGEMENT

Cam involvement

J Orthop Surg Res. 2014 Oct 10

Prevalence and characteristics of cam-type femoroacetabular deformity in 100 hips with symptomatic acetabular dysplasia: a case control study.

Ida T, Nakamura Y, Hagio T, Naito M.

Abstract

Background: Cam-type femoroacetabular deformity in acetabular dysplasia (AD) has not been well clarified. The primary purpose of this study was to determine the prevalence and characteristics of femoroacetabular deformity in symptomatic AD patients.

Methods: We retrospectively reviewed the cases of 86 women (92 hips) and eight men (eight hips) with symptomatic AD. The mean patient age was 37.9 (range, 14;60) years. All participants underwent lateral cross-table and lateral whole-spine radiographic examinations to measure the alpha angle and pelvic tilt. Pelvic computed tomography scans were used to measure femoral anteversion. The patients were classified into two groups: AD only group, containing hips with an alpha angle less than 55°; and AD with cam-type femoroacetabular deformity (AD+cam-type deformity) group, containing hips with an alpha angle greater than or equal to 55°.

Results: Of the patients with AD, 40 hips displayed additional radiographic evidence of cam-type morphology, while 60 hips had exclusive AD morphology. The patients in the AD+cam-type deformity group had significantly increased forward pelvic tilt in the standing position ($p = 0.023$) and decreased femoral anteversion ($p = 0.047$) compared with the AD only group.

Conclusions: Our data revealed that 40% of patients with AD also had radiographic evidence of cam-type femoroacetabular deformity. Greater forward pelvic tilt in the standing position and decreased femoral anteversion seemed to be associated with the cam-type deformity in these patients. These results indicate the morphological features that are most likely to induce secondary symptoms to developmental hip dysplasia. It is suggested that the symptoms in the AD+cam-type deformity group could arise through femoroacetabular impingement (FAI) after periacetabular osteotomy, because a predisposition was present preoperatively.

PMID: 25300562

Pelvic position

Am J Sports Med. 2014 Oct. Epub 2014 Jul 24.

Effect of changes in pelvic tilt on range of motion to impingement and radiographic parameters of acetabular morphologic characteristics.

Ross JR¹, Nepple JJ², Philippon MJ², Kelly BT³, Larson CM⁴, Bedi A⁵.

Abstract

BACKGROUND: The current understanding of the effect of dynamic changes in pelvic tilt on the functional acetabular orientation and occurrence of femoroacetabular impingement (FAI) is limited.

PURPOSE: To determine the effect of changes in pelvic tilt on (1) terminal hip range of motion and (2) measurements of acetabular version as assessed on 2- and 3-dimensional imaging.

METHODS:

Preoperative pelvic computed tomographic scans of 48 patients (50 hips) who underwent arthroscopic surgery for the treatment of FAI were analyzed. The mean age of the study population was 25.7 years (range, 14-56 years), and 56% were male. Three-dimensional models of the hips were created, allowing manipulation of the pelvic tilt and simulation of hip range of motion to osseous contact. Acetabular version was measured and the presence of the crossover sign, prominent ischial spine sign, and posterior wall sign was recorded on simulated plain radiographs. Measurements of range of motion to bony impingement during (1) hip flexion, (2) internal rotation in 90° of flexion, and (3) internal rotation in 90° of flexion and 15° adduction were performed, and the location of bony contact between the proximal femur and acetabular rim was defined. These measurements were calculated for -10° (posterior), 0° (native), and +10° (anterior) pelvic orientations.

RESULTS:

In native tilt, mean cranial acetabular version was 3.3°, while central version averaged 16.2°. Anterior pelvic tilt (10° change) resulted in significant retroversion, with mean decreases in cranial and central version of 5.9° and 5.8°, respectively ($P < .0001$ for both). Additionally, this resulted in a significantly increased proportion of positive crossover, posterior wall, and prominent ischial spine signs ($P < .001$ for all). Anterior pelvic tilt (10° change) resulted in a decrease in internal rotation in 90° of flexion of 5.9° ($P < .0001$) and internal rotation in 90° of flexion and 15° adduction of 8.5° ($P < .0001$), with a shift in the location of osseous impingement more anteriorly. Posterior pelvic tilt (10° change) resulted in an increase in internal rotation in 90° of flexion of 5.1° ($P < .0001$) and internal rotation in 90° of flexion and 15° adduction of 7.4° ($P < .0001$), with a superolateral shift in the location of osseous impingement.

CONCLUSION/CLINICAL RELEVANCE:

Dynamic changes in pelvic tilt significantly influence the functional orientation of the acetabulum and must be considered. Dynamic anterior pelvic tilt is predicted to result in earlier occurrence of FAI in the arc of motion, whereas dynamic posterior pelvic tilt results in later occurrence of FAI, which may have implications regarding nonsurgical treatments for FAI.

KNEE

Holistic approach to anterior knee pain

Knee Surg Sports Traumatol Arthrosc. 2014 Oct. Epub 2014 Apr 24.

Holistic approach to understanding anterior knee pain. Clinical implications.

Sanchis-Alfonso V.

Abstract

Purpose and Background: Anterior knee pain is one of the most frequent reasons for consultation within knee conditions. The aetiology is not well known, which explains the sometimes unpredictable results of its treatment.

Analysis: Normally, when we see a patient in the office with anterior knee pain, we only study and focus on the knee. If we do this, we are making a big mistake. We must not forget to evaluate the pelvis and proximal femur, as well as the psychological factors that modulate the course of the illness. Both the pelvifemoral dysfunction as well as the psychological factors (anxiety, depression, catastrophization and kinesiophobia) must be included in our therapeutic targets of the multidisciplinary treatment of anterior knee pain. We must not only focus on the knee, we must remember to "look up" to fully understand what is happening and be able to solve this difficult problem. The aetiology of anterior knee pain is multifactorial.

Conclusions: Diagnosis and treatment of patellofemoral disorders must be individualized. Our findings stress the importance of tailoring physiotherapy, surgery and psycho-educational interventions to each patient.

PMID: 24760163

Anterior knee pain and PT

Knee Surg Sports Traumatol Arthrosc. 2014 Oct; Epub 2014 Jul 6.

Anterior knee pain: an update of physical therapy.

Werner S.

Abstract

Purpose and Background: Anterior knee pain is one of the most common knee problems in physically active individuals. The reason for anterior knee pain has been suggested to be multifactorial with patella abnormalities or extensor mechanism disorder leading to patellar malalignment during flexion and extension of the knee joint.

Analysis and Recommended Approach: Some patients complain mostly of non-specific knee pain, while others report patellar instability problems. The patients present with a variety of symptoms and clinical findings, meaning that a thorough clinical examination is the key for optimal treatment. Weakness of the quadriceps muscle, especially during eccentric contractions, is usually present in the majority of anterior knee pain patients. However, irrespective of whether pain or instability is the major problem, hypotrophy and reduced activity of the vastus medialis are often found, which result in an imbalance between vastus medialis and vastus lateralis. This imbalance needs to be corrected before quadriceps exercises are started. The non-operative rehabilitation protocol should be divided into different phases based on the patient's progress. The goal of the first phase is to reduce pain and swelling, improve the balance between vastus medialis and vastus lateralis, restore normal gait, and decrease loading of the patello-femoral joint. The second phase should include improvement of postural control and coordination of the lower extremity, increase of quadriceps strength and when needed hip muscle strength, and restore good knee function. The patient should be encouraged to return to or to start with a suitable regular physical exercise. Therefore, the third phase should include functional exercises. Towards the end of the treatment, single-leg functional tests and functional knee scores should be used for evaluating clinical outcome.

Conclusions: A non-operative treatment of patients with anterior knee pain should be tried for at least 3 months before considering other treatment options.

PMID: 24997734

OA strength

Arthritis Care Res (Hoboken). 2014 Oct 9.

Relationship between isometric thigh muscle strength and minimal clinically important differences (MCIDs) in knee function in osteoarthritis - data from the osteoarthritis initiative.

Ruhdorfer A¹, Wirth W, Eckstein F.

Abstract

Objective: To determine the relationship between thigh muscle strength and clinically relevant differences in self-assessed lower limb function.

Methods: Isometric knee extensor and flexor strength of 4553 Osteoarthritis Initiative participants (2651 women/1902 men) was related to Western Ontario McMasters Universities (WOMAC) physical function scores by linear regression. Further, groups of Male and female participant strata with minimal clinically important differences (MCIDs) in WOMAC function scores (6/68) were compared across the full range of observed values, and to participants without functional deficits (WOMAC=0). The effect of WOMAC knee pain and body mass index on the above relationships was explored using stepwise regression.

Results: Per regression equations, a 3.7% reduction in extensor and a 4.0% reduction in flexor strength were associated with an MCID in WOMAC function in women, and a 3.6%/4.8% reduction in men. For strength divided by body weight, reductions were 5.2%/6.7% in women and 5.8%/6.7% in men. Comparing MCID strata across the full observed range of WOMAC function confirmed the above estimates and did not suggest non-linear relationships across the spectrum of observed values. WOMAC pain correlated strongly with WOMAC function, but extensor (and flexor) muscle strength contributed significant independent information.

Conclusion: Reductions of approximately 4% in isometric muscle strength and of 6% in strength/weight were related to a clinically relevant difference in WOMAC functional disability. Longitudinal studies will need to confirm these relationships within persons. Muscle extensor (and flexor) strength (per body weight) provided significant independent information in addition to pain in explaining variability in lower limb function.

KEYWORDS:

Function; Knee Osteoarthritis; Minimal Clinically Important Difference; Muscle Strength; WOMAC

PMID: 25303012

KNEE/ACL**Virtual training**

Knee Surg Sports Traumatol Arthrosc. 2014 Oct 14.

Immersive virtual reality improves movement patterns in patients after ACL reconstruction: implications for enhanced criteria-based return-to-sport rehabilitation.

Gokeler A¹, Bisschop M, Myer GD, Benjaminse A, Dijkstra PU, van Keeken HG, van Raay JJ, Burgerhof JG, Otten E.

Abstract**PURPOSE:**

The purpose of this study was to evaluate the influence of immersion in a virtual reality environment on knee biomechanics in patients after ACL reconstruction (ACLR). It was hypothesized that virtual reality techniques aimed to change attentional focus would influence altered knee flexion angle, knee extension moment and peak vertical ground reaction force (vGRF) in patients following ACLR.

METHODS:

Twenty athletes following ACLR and 20 healthy controls (CTRL) performed a step-down task in both a non-virtual reality environment and a virtual reality environment displaying a pedestrian traffic scene. A motion analysis system and force plates were used to measure kinematics and kinetics during a step-down task to analyse each single-leg landing.

RESULTS:

A significant main effect was found for environment for knee flexion excursion ($P = n.s.$). Significant interaction differences were found between environment and groups for vGRF ($P = 0.004$), knee moment ($P < 0.001$), knee angle at peak vGRF ($P = 0.01$) and knee flexion excursion ($P = 0.03$). There was larger effect of virtual reality environment on knee biomechanics in patients after ACLR compared with controls.

CONCLUSION:

Patients after ACLR immersed in virtual reality environment demonstrated knee joint biomechanics that approximate those of CTRL. The results of this study indicate that a realistic virtual reality scenario may distract patients after ACLR from conscious motor control. Application of clinically available technology may aid in current rehabilitation programmes to target altered movement patterns after ACLR.

LEVEL OF EVIDENCE:

Diagnostic study, Level III.

PMID: 25311052

MENISCUS

Meniscal root

Am J Sports Med. 2014 Oct; Epub 2014 Aug 8.

Anatomy of the anterior root attachments of the medial and lateral menisci: a quantitative analysis.

LaPrade CM¹, Ellman MB², Rasmussen MT¹, James EW³, Wijdicks CA¹, Engebretsen L⁴, LaPrade RF⁵.

Abstract

BACKGROUND AND HYPOTHESIS:

While the biomechanical importance of the meniscal roots has been demonstrated, the anatomy of the anterior meniscal roots remains largely unknown. Defining the quantitative anatomy of the anterior meniscal root attachments is essential for developing improved diagnostic and surgical techniques. The anterior medial (AM) and anterior lateral (AL) meniscal roots could be quantitatively defined relative to open and arthroscopic surgical landmarks.

METHODS:

Twelve nonpaired human cadaveric knees were used (average age, 51.3 years). A coordinate measuring device quantified the anatomic relationships of the AM and AL root attachments to open and arthroscopic surgical landmarks. The tibial attachments of both anterior roots were defined and quantified by categorizing the fibers of the root as either central, dense attachments or peripheral, supplemental attachments.

RESULTS:

The center of the tibial tuberosity and the medial tibial eminence apex were 27.0 mm lateral and distal and 27.5 mm posterior to the center of the AM root, respectively. The center of the anterior cruciate ligament (ACL) and the lateral tibial eminence apex were 5.0 mm posteromedial and 14.4 mm posterolateral to the center of the AL root, respectively. The AM root attachment had a mean area of 110.4 mm² (95% CI, 92.2-128.5) with a central attachment of 56.3 mm² (95% CI, 46.9-65.8). The AL root attachment had a mean area of 140.7 mm² (95% CI, 121.6-159.8) and inserted deeply beneath the ACL in all specimens. The overlap of the ACL on the AL root averaged 88.9 mm² (95% CI, 63.3-114.6), comprising 63.2% of the AL root attachment.

CONCLUSION AND CLINICAL RELEVANCE:

The anterior meniscal roots were identified in relation to pertinent open and arthroscopic landmarks. The extended overlap between the AL root and ACL attachment revealed a more intimate tibial attachment relationship than previously recognized. Quantitative descriptions of the anterior meniscal roots elucidate the relationship between the root attachments and pertinent surgical landmarks. In addition, the supplemental attachments of both menisci may contribute to native meniscal function, and further investigation is recommended.

PT vs surgery

Int Orthop. 2014 Oct 10

Arthroscopic partial meniscectomy is superior to physical rehabilitation in the management of symptomatic unstable meniscal tears.

El Ghazaly SA¹, Rahman AA, Yusry AH, Fathalla MM.

Abstract**PURPOSE:**

Meniscus injuries are the most commonly reported in athletes. Meniscectomy is the most common treatment. Stable peripheral tears may heal, while degenerative tears do well with physical therapy. However, the exact role of physical therapy in treating symptomatic unstable meniscal tears is not known. We aimed to identify the role of physical therapy in treating such patients and clarify the role of arthroscopic partial meniscectomy in treating unstable meniscal tears.

METHODS:

Seventy patients with unstable meniscal tear met the inclusion criteria according to Vande Berg and co-workers. Clinical examination, McMurray test and magnetic resonance imaging were done. Age ranged from 18-67 years (average 39.87). Mild osteoarthritis was seen in 20 cases. Physical therapy thrice a week for eight weeks was offered (faradic quadriceps stimulation and neuromuscular strengthening exercises). After physical therapy, patients still complaining or unsatisfied were offered arthroscopic partial meniscectomy (APM). Outcomes were evaluated using the VAS pain score and the Lysholm knee score.

RESULTS:

Mean VAS before interventions was 7.4, significantly improved to 5.16 after rehabilitation and to 1.9 after APM ($p = 0.001$). Mean Lysholm score before rehabilitation was 65.1 and improved to 69.6 after rehabilitation, the difference was non-significant. However, Lysholm score difference before and after APM showed a highly significant difference ($p = 0.001$).

CONCLUSIONS:

Pain and swelling improved after physical therapy. However, patients were not satisfied as limited range of knee motion persisted. APM was superior to physical therapy in treating symptomatic unstable meniscal tears, with high patient satisfaction and restored knee function.

PMID: 25300394

PATELLA**Exercise and PF pain**

Phys Ther. 2014 Jul 31.

Effectiveness of Exercise Therapy in Treatment of Patients With Patellofemoral Pain Syndrome: A Systematic Review and Meta-Analysis.

Clijisen R¹, Fuchs J², Taeymans J³.

Abstract**BACKGROUND AND PURPOSE:**

This systematic review and meta-analysis was accomplished to determine whether exercise therapy is an effective intervention to reduce pain and patient-reported measures of activity limitations and participation restrictions (PRMALP) in patients with patellofemoral pain.

DATA SOURCES AND STUDY SELECTION:

Randomized controlled trials in English and German languages published in the MEDLINE, Physiotherapy Evidence Database (PEDro), International Clinical Trials Registry Platform, and Cochrane databases were searched. Eligibility was assessed in 2 stages. The methodological quality of the studies was rated using the PEDro scale. Data were pooled using random-effects meta-analysis, allowing for variability among studies. For clinical use, overall estimates were re-expressed in the original visual analog scale scores. Significance was set at 5%.

DATA EXTRACTION AND DATA SYNTHESIS:

Fifteen studies, with a total of 748 participants, were included and pooled for the meta-analysis. Six studies compared the effect of exercise therapy with a control group receiving neither exercise therapy nor another intervention. Four studies compared the effect of exercise therapy versus additive therapy, and 5 studies compared different exercise interventions. In both comparisons, exercise therapy resulted in strong pain reduction and improvement of PRMALP effects. Significant short-term effects (≤ 12 weeks) of exercise therapy were found for pain and PRMALP, whereas long-term effects (≥ 26 weeks) were observed for PRMALP only.

LIMITATIONS AND CONCLUSION:

The 15 studies included in this analysis were of variable quality. Large-scale, high-quality randomized controlled trials are needed to further the evaluation of the possible effects of different exercise therapy modalities on patellofemoral pain. This meta-analysis presents evidence that exercise therapy has a strong pain-reducing effect and decreases PRMALP in patients with patellofemoral pain. However, the question of which exercise modality yields the strongest reducing effect on pain and PRMALP remains unanswered.

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PMID:25082920

KNEE/TOTAL

Neglect of knee

The relationship among psychological factors, neglect-like symptoms and postoperative pain after total knee arthroplasty

Pain Research and Management, 10/15/2014 Clinical Article

Hirakawa Y, et al.

Purpose: The authors hypothesized that neglect-like symptoms (NLS) were an important contributor to postoperative pain. These results suggest that facilitation of sensory integration is important in rehabilitation after TKA because NLS appears to result from impaired sensory integration. The association of PCS scores with postoperative pain and NLS suggests the need to provide appropriate postoperative education to reduce persistent negative thoughts regarding future pain.

Methods

- The factors influencing pain were investigated using a longitudinal study with assessments at three and six weeks postsurgery.
- The relationships among demographic factors (age, body weight, body mass index), psychological factors (State-Trait Anxiety Inventory and Pain Catastrophizing Scale [PCS]) and NLS with postoperative pain were investigated in 90 patients after TKA.
- The associations among motor functions (muscle strength of knee extension, range of motion), sensory functions (joint position sense and two-point discrimination in the thigh) and NLS were also investigated.

Results

- At three and six weeks after surgery, 36% and 19% of patients, respectively, experienced NLS.
- In hierarchical multiple regression analysis, NLS and PCS scores were significantly associated with postoperative pain, while joint position sense and range of motion were significantly associated with NLS.

FOOT AND ANKLE

Ankle pain and psychology

Foot Ankle Int. 2014 Oct 9.

Psychological Factors and Personality Traits Associated With Patients in Chronic Foot and Ankle Pain.

Shivarathre DG¹, Howard N², Krishna S³, Cowan C⁴, Platt SR⁴.

Abstract

BACKGROUND:

The impact of psychosocial factors and personality traits in chronic pain is well established. However, there has been limited literature analyzing the influence of psychological issues in chronic foot and ankle pain. The aim of our study was to identify the association of certain psychosocial factors and personality traits in individuals with chronic painful foot and ankle disorders.

METHODS:

Patients with chronic foot and ankle pain were recruited from the specialist foot and ankle clinic. The Eysenck Personality Questionnaire-Revised (EPQ-R), Dysfunctional Attitude Scale (DAS), and Hospital Anxiety Depression (HAD) scale were administered in the form of questionnaires. An age- and sex-matched cohort of healthy volunteers served as the control group. Sample size was determined after power calculation, and a total of 90 participants were recruited with informed consent with 45 participants in each arm. Results were analyzed and statistical analyses were performed using SPSS.

RESULTS:

Patients with chronic foot and ankle pain had significantly higher neuroticism scores than the control group ($P < .05$). The study also revealed greater prevalence of anxiety and depression in patients with chronic pain ($P < .05$).

CONCLUSION:

The study showed a significant association of anxiety, depression, and neuroticism in patients presenting with chronic foot and ankle pain. Clinicians should recognize the influence of these specific psychological issues to provide a more holistic approach to the clinical problem.

KEYWORDS:

anxiety; chronic foot pain; depression; neuroticism; psychological

PMID: 25301891

Talor cartilage defects

Foot Ankle Int. 2014 Oct 6

Natural History of Nonoperatively Treated Osteochondral Lesions of the Talus.

Klammer G¹, Maquieira GJ¹, Spahn S¹, Vigfusson V¹, Zanetti M¹, Espinosa N².

Abstract**BACKGROUND:**

We hypothesized that patients undergoing nonoperative treatment for asymptomatic or minimally symptomatic osteochondral lesions of the talus (OLTs) would not deteriorate clinically or radiologically over time.

METHODS:

Forty-eight patients (mean age = 48 years; range, 13-78 years) with an OLT confirmed by magnetic resonance imaging (MRI) who had not undergone ankle joint surgery were retrospectively reviewed. All patients were evaluated after a minimum follow-up of 2 years (mean = 52 months; range, 27-124 months). All patients filled out an individual questionnaire and underwent a physical and radiographic assessment (radiograph and hindfoot MRI).

RESULTS:

At final follow-up, 43 ankles (86%) in 41 patients were pain-free (visual analogue scale [VAS] 0, n = 12) or less painful (VAS 1-3, n = 31). Radiographically, osteoarthritis was absent in 47%, and grade 1 and 2 osteoarthritis each were found in 27% (van Dijk classification). Magnetic resonance imaging revealed no substantial progression in staging or lesion size. Pain at time of follow-up correlated with the depth of the lesion at initial MRI ($P < .05$) and with subchondral cyst formation and presence or change of bone marrow edema at follow-up MRI ($P < .05$).

CONCLUSION:

Minimally symptomatic OLTs did not appear to progress or worsen over time when treated nonoperatively.

KEYWORDS:

natural history; nonoperative; osteochondral lesion; talus

PMID: 25288330

Kinesio tape

J Sport Rehabil. 2014 Oct 13.

The Effect of Ankle Kinesio Tape on Ankle Muscle Activity During a Drop Landing.

Fayson SD¹, Needle AR, Kaminski TW.

Abstract

CONTEXT:

The use of Kinesio tape among healthcare professional has grown recently in efforts to efficiently prevent and treat joint injuries. However, limited evidence exists regarding the efficacy of this technique in enhancing joint stability and neuromuscular control.

OBJECTIVE:

This study aimed to determine how Kinesio tape application to the ankle joint alters forces and muscle activity during a drop jump maneuver.

DESIGN:

Single group pre-test post-test.

SETTING:

University laboratory.

SUBJECTS:

22 healthy adults with no previous history of ankle injury.

INTERVENTIONS:

Participants were instrumented with electromyography on the lower leg muscles as they jumped from a 35cm platform onto force plates. Test trials were performed without tape (BL), immediately following application of Kinesio tape to the ankle (KT-I), and following 24-hours of continued use (KT-24).

MAIN OUTCOME MEASURES:

Peak (N/kgbw) and time-to-peak (sec) ground reaction forces were compared across taping conditions, as well as the timing (sec) and amplitude (%Peak) of muscle activity from the tibialis anterior, peroneus longus and lateral gastrocnemius were compared across taping conditions.

RESULTS:

No significant differences in amplitude or timing of ground reaction forces were observed ($p>0.05$). However, muscle activity was observed to decrease from BL to KT-I in the tibialis anterior ($p=0.027$), and from BL to KT-24 in the PL ($p=0.022$).

CONCLUSIONS:

Our data suggest that Kinesio tape decreases muscle activity in the ankle during a drop jump maneuver, although no changes in ground reaction forces were observed. This is contrary to the proposed mechanisms of Kinesio tape. Further research might investigate how this effects participants with a history of injury.

PMID: 25310202

ACHILLES TENDON

Tear and surgery

Am J Sports Med. 2014 Oct; Epub 2014 Jul 23.

Acute achilles tendon ruptures: incidence of injury and surgery in sweden between 2001 and 2012.

Huttunen TT¹, Kannus P², Rolf C³, Felländer-Tsai L³, Mattila VM⁴.

Abstract

BACKGROUND:

Population-based incidence rates and trends of acute Achilles tendon ruptures are not known. It is also not known whether recent high-quality randomized controlled trials not favoring surgery have had an effect on treatment protocols.

PURPOSE:

To assess the incidence of acute Achilles tendon ruptures in Sweden and to examine the trends in surgical treatment.

STUDY DESIGN:

Descriptive epidemiology study.

METHODS:

We conducted a nationwide registry-based study including all adult (≥ 18 years of age) inpatient and outpatient hospital visits because of an acute Achilles tendon rupture in Sweden between 2001 and 2012.

RESULTS:

We identified a total of 27,702 patients (21,979 men, 79%) with acute Achilles tendon ruptures between 2001 and 2012. In 2001, the sex-specific incidence of acute Achilles tendon ruptures was 47.0 (per 100,000 person-years) in men and 12.0 in women. In 2012, the corresponding values were 55.2 in men and 14.7 in women, with an increase of 17% in men and 22% in women. The proportion of surgically treated patients declined from 43% in 2001 to 28% in 2012 in men and from 34% in 2001 to 22% in 2012 in women.

CONCLUSION:

The incidence of acute Achilles tendon ruptures in Sweden is increasing. The most probable reason for this increase is the rise in the number of older adults participating in high-demand sports. The proportion of surgically treated patients is decreasing most likely because of recent high-quality randomized controlled trials and their meta-analyses supporting similar results between surgical and nonsurgical approaches.

KEYWORDS:

Achilles tendon; epidemiology; incidence; injury; surgical treatment

PMID: 2505698

PLANTAR SURFACE

Factors for heel pain

Foot Ankle Int. 2014 Sep 18.

Musculoskeletal and Activity-Related Factors Associated With Plantar Heel Pain.

Sullivan J¹, Burns J², Adams R³, Pappas E³, Crosbie J⁴.

Abstract

BACKGROUND:

Despite the prevalence and impact of plantar heel pain, its etiology remains poorly understood, and there is no consensus regarding optimum management. The identification of musculoskeletal factors related to the presence of plantar heel pain could lead to the development of better targeted intervention strategies and potentially improve clinical outcomes. The aim of this study was to investigate relationships between a number of musculoskeletal and activity-related measures and plantar heel pain.

METHODS:

In total, 202 people with plantar heel pain and 70 asymptomatic control participants were compared on a variety of musculoskeletal and activity-related measures, including body mass index (BMI), foot and ankle muscle strength, calf endurance, ankle and first metatarsophalangeal (MTP) joint range of motion, foot alignment, occupational standing time, exercise level, and generalized hypermobility. Following a comparison of groups for parity of age, analyses of covariance were performed to detect differences between the 2 groups for any of the variables measured.

RESULTS:

The plantar heel pain group displayed a higher BMI, reduced ankle dorsiflexion range of motion, reduced ankle evtor and toe flexor strength, and an altered inversion/eversion strength ratio. There were no differences between groups for foot alignment, dorsiflexor or invertor strength, ankle inversion or eversion range of motion, first MTP joint extension range of motion, generalized hypermobility, occupational standing time, or exercise level.

CONCLUSION:

Plantar heel pain is associated with higher BMI and reductions in some foot and ankle strength and flexibility measures. Although these factors could be either causal or consequential, they are all potentially modifiable and could be targeted in the management of plantar heel pain.

KEYWORDS:

Strength; flexibility; foot alignment; obesity

PMID: 25237175

MANUAL THERAPY

Manual Therapy

Analgesic effects of manual therapy in patients with musculoskeletal pain: A systematic review

Lennard Voogt

Abstract

Background

Current evidence shows that manual therapy elicits analgesic effect in different populations (healthy, pain inflicted and patients with musculoskeletal pain) when carried out at the spinal column, although the clinical significance of these effects remains unclear. Also the analgesic effects of manual therapy on peripheral joints have not been systematically reviewed.

Methods

A systematic review was carried out following the PRISMA-guidelines. Manual therapy was defined as any manual induced articular motion with the aim of inducing analgesic effects. Outcome measure was pain threshold.

Results

A total of 13 randomized trials were included in the review. In 10 studies a significant effect was found. Pressure pain thresholds increased following spinal or peripheral manual techniques. In three studies both a local and widespread analgesic effect was found. No significant effect was found on thermal pain threshold.

Discussion

Moderate evidence indicated that manual therapy increased local pressure pain thresholds in musculoskeletal pain, immediately following the intervention. No consistent result was found on remote pressure pain threshold. No significant changes occurred on thermal pain threshold values. The clinical relevance of these effects remains contradictory and therefore unclear.

Keywords:

Manual therapy, Pain modulation, Pain threshold, Systematic review

MT and chronic HA

J Headache Pain. 2014 Oct 2

Manual therapies for primary chronic headaches: a systematic review of randomized controlled trials.

Chaibi A¹, Russell MB.

Abstract

Purpose: This is to our knowledge the first systematic review regarding the efficacy of manual therapy randomized clinical trials (RCT) for primary chronic headaches.

Methods: A comprehensive English literature search on CINHAL, Cochrane, Medline, Ovid and PubMed identified 6 RCTs all investigating chronic tension-type headache (CTTH). One study applied massage therapy and five studies applied physiotherapy. Four studies were considered to be of good methodological quality by the PEDro scale. All studies were pragmatic or used no treatment as a control group, and only two studies avoided co-intervention, which may lead to possible bias and makes interpretation of the results more difficult.

Results: The RCTs suggest that massage and physiotherapy are effective treatment options in the management of CTTH. One of the RCTs showed that physiotherapy reduced headache frequency and intensity statistical significant better than usual care by the general practitioner. The efficacy of physiotherapy at post-treatment and at 6 months follow-up equals the efficacy of tricyclic antidepressants. Effect size of physiotherapy was up to 0.62.

Conclusions: Future manual therapy RCTs are requested addressing the efficacy in chronic migraine with and without medication overuse. Future RCTs on headache should adhere to the International Headache Society's guidelines for clinical trials, i.e. frequency as primary end-point, while duration and intensity should be secondary end-point, avoid co-intervention, includes sufficient sample size and follow-up period for at least 6 months.

PMID: 25278005

Blood flow and MT

Man Ther. 2014 Sep 10.

Assessment of skin blood flow following spinal manual therapy: A systematic review.

Zegarra-Parodi R¹, Park PY², Heath DM³, Makin IR³, Degenhardt BF⁴, Roustit M⁵.

Abstract

Purpose: Skin blood flow (SBF) indexes have been used to describe physiological mechanisms associated with spinal manual therapy (SMT). The aims of the current review were to assess methods for data collection, assess how investigators interpreted SBF changes, and formulate recommendations to advance manual medicine research.

Methods: A database search was performed in PubMed, Cochrane Library, the Physiotherapy Evidence Database, and the Cumulative Index to Nursing and Allied Health Literature through April 2014. Articles were included if at least 1 outcome measure was changes in 1 SBF index following SMT. The database search yielded 344 records. Two independent authors applied the inclusion criteria. Twenty studies met the inclusion criteria.

Results: Selected studies used heterogeneous methods to assess short-term post-SMT changes in SBF, usually vasoconstriction, which was interpreted as a general sympathoexcitatory effect through central mechanisms. However, this conclusion might be challenged by the current understanding of skin sympathetic nervous activity over local endothelial mechanisms that are specifically controlling SBF. Evaluation of SBF measurements in peripheral tissues following SMT may document physiological responses that are beyond peripheral sympathetic function.

Conclusions: Based on the current use of SBF indexes in clinical and physiological research, 14 recommendations for advancing manual medicine research using laser Doppler flowmetry are presented.

KEYWORDS:

Skin blood flow index; Skin microcirculation; Spinal manual therapy; Systematic review

PMID: 25261088

Radicular pain and manipulation

Ann Intern Med. 2014 Sep 16;

Spinal manipulation and home exercise with advice for subacute and chronic back-related leg pain: a trial with adaptive allocation.

Bronfort G, Hondras MA, Schulz CA, Evans RL, Long CR, Grimm R.

Abstract

BACKGROUND:

Back-related leg pain (BRLP) is often disabling and costly, and there is a paucity of research to guide its management.

OBJECTIVE:

To determine whether spinal manipulative therapy (SMT) plus home exercise and advice (HEA) compared with HEA alone reduces leg pain in the short and long term in adults with BRLP.

DESIGN:

Controlled pragmatic trial with allocation by minimization conducted from 2007 to 2011. (ClinicalTrials.gov: NCT00494065).

PATIENTS:

Persons aged 21 years or older with BRLP for least 4 weeks.

INTERVENTION:

12 weeks of SMT plus HEA or HEA alone.

MEASUREMENTS:

The primary outcome was patient-rated BRLP at 12 and 52 weeks. Secondary outcomes were self-reported low back pain, disability, global improvement, satisfaction, medication use, and general health status at 12 and 52 weeks. Blinded objective tests were done at 12 weeks.

RESULTS:

Of the 192 enrolled patients, 191 (99%) provided follow-up data at 12 weeks and 179 (93%) at 52 weeks. For leg pain, SMT plus HEA had a clinically important advantage over HEA (difference, 10 percentage points [95% CI, 2 to 19]; $P = 0.008$) at 12 weeks but not at 52 weeks (difference, 7 percentage points [CI, -2 to 15]; $P = 0.146$). Nearly all secondary outcomes improved more with SMT plus HEA at 12 weeks, but only global improvement, satisfaction, and medication use had sustained improvements at 52 weeks. No serious treatment-related adverse events or deaths occurred.

CONCLUSION:

For patients with BRLP, SMT plus HEA was more effective than HEA alone after 12 weeks, but the benefit was sustained only for some secondary outcomes at 52 weeks.

PMID: 25222385

CNS changes and manipulation

Manipulative Physiol Ther. 2014 Oct 2.

Immediate Changes After Manual Therapy in Resting-State Functional Connectivity as Measured by Functional Magnetic Resonance Imaging in Participants With Induced Low Back Pain.

Gay CW¹, Robinson ME², George SZ³, Perlstein WM⁴, Bishop MD⁵.

Abstract**OBJECTIVE:**

The purposes of this study were to use functional magnetic resonance imaging to investigate the immediate changes in functional connectivity (FC) between brain regions that process and modulate the pain experience after 3 different types of manual therapies (MT) and to identify reductions in experimentally induced myalgia and changes in local and remote pressure pain sensitivity.

METHODS:

Twenty-four participants (17 men; mean age \pm SD, 21.6 \pm 4.2 years) who completed an exercise-injury protocol to induce low back pain were randomized into 3 groups: chiropractic spinal manipulation (n = 6), spinal mobilization (n = 8), or therapeutic touch (n = 10). The primary outcome was the immediate change in FC as measured on functional magnetic resonance imaging between the following brain regions: somatosensory cortex, secondary somatosensory cortex, thalamus, anterior and posterior cingulate cortices, anterior and poster insula, and periaqueductal gray. Secondary outcomes were immediate changes in pain intensity, measured with a 101-point numeric rating scale, and pain sensitivity, measured with a handheld dynamometer. Repeated-measures analysis of variance models and correlation analyses were conducted to examine treatment effects and the relationship between within-person changes across outcome measures.

RESULTS:

Changes in FC were found between several brain regions that were common to all 3 MT interventions. Treatment-dependent changes in FC were also observed between several brain regions. Improvement was seen in pain intensity after all interventions ($P < .05$) with no difference between groups ($P > .05$). There were no observed changes in pain sensitivity, or an association between primary and secondary outcome measures.

CONCLUSION:

These results suggest that MTs (chiropractic spinal manipulation, spinal mobilization, and therapeutic touch) have an immediate effect on the FC between brain regions involved in processing and modulating the pain experience. This suggests that neurophysiologic changes after MT may be an underlying mechanism of pain relief.

KEYWORDS: Chiropractic; Magnetic Resonance Imaging; Musculoskeletal Manipulations; Neurophysiology Brain

PMID: 25284739

Neck pain and MT

Physiother Theory Pract. 2014 Sep 29

Effectiveness of mobilization therapy and exercises in mechanical neck pain.

Ganesh GS¹, Mohanty P, Pattnaik M, Mishra C.

Abstract

Abstract Objectives: While studies have looked into the effects of Maitland mobilization on symptom relief, to date, no work has specifically looked at the effects of Mulligan mobilization. The objective of this work was to compare the effectiveness of Maitland and Mulligan's mobilization and exercises on pain response, range of motion (ROM) and functional ability in patients with mechanical neck pain.

Methods: A total sample of 60 subjects (21-45 years of age) with complaints of insidious onset of mechanical pain that has lasted for less than 12 weeks and reduced ROM were randomly assigned to: group I - Maitland mobilization and exercises; group - II Mulligan mobilization and exercises; and group-III exercises only, and assessed for dependent variables by a blinded examiner.

Results: Post measurement readings revealed statistical significance with time ($p < 0.00$) and no significance between groups ($p > 0.05$) indicating no group is superior to another after treatment and at follow-up. The effect sizes between the treatment groups were small.

Conclusion: Our results showed that manual therapy interventions were no better than supervised exercises in reducing pain, improving ROM and neck disability.

KEYWORDS:

Exercise; musculo skeletal manipulations; neck pain

PMID: 25264016

Mulligan

Man Ther. 2014 Oct;19. Epub 2014 Jan 10.

Mulligan Concept manual therapy: standardizing annotation.

McDowell JM¹, Johnson GM², Hetherington BH³.

Abstract

Quality technique documentation is integral to the practice of manual therapy, ensuring uniform application and reproducibility of treatment. Manual therapy techniques are described by annotations utilizing a range of acronyms, abbreviations and universal terminology based on biomechanical and anatomical concepts. The various combinations of therapist and patient generated forces utilized in a variety of weight-bearing positions, which are synonymous with Mulligan Concept, challenge practitioners existing annotational skills. An annotation framework with recording rules adapted to the Mulligan Concept is proposed in which the abbreviations incorporate established manual therapy tenets and are detailed in the following sequence of; starting position, side, joint/s, method of application, glide/s, Mulligan technique, movement (or function), whether an assistant is used, overpressure (and by whom) and numbers of repetitions or time and sets. Therapist or patient application of overpressure and utilization of treatment belts or manual techniques must be recorded to capture the complete description. The adoption of the Mulligan Concept annotation framework in this way for documentation purposes will provide uniformity and clarity of information transfer for the future purposes of teaching, clinical practice and audit for its practitioners.

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KEYWORDS:

Annotation; Clinical records; Manual therapy; Mulligan Concept

PMID: 24491791

MT assessment

J Manipulative Physiol Ther. 2014 Oct. Epub 2014 Sep 5.

The risk of bias and sample size of trials of spinal manipulative therapy for low back and neck pain: analysis and recommendations.

Rubinstein SM¹, van Eekelen R², Oosterhuis T³, de Boer MR⁴, Ostelo RW⁵, van Tulder MW⁵.

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

The purpose of this study was to evaluate changes in methodological quality and sample size in randomized controlled trials (RCTs) of spinal manipulative therapy (SMT) for neck and low back pain over a specified period. A secondary purpose was to make recommendations for improvement for future SMT trials based upon our findings.

METHODS:

Randomized controlled trials that examined the effect of SMT in adults with neck and/or low back pain and reported at least 1 patient-reported outcome measure were included. Studies were identified from recent Cochrane reviews of SMT, and an update of the literature was conducted (March 2013). Risk of bias was assessed using the 12-item criteria recommended by the Cochrane Back Review Group. In addition, sample size was examined. The relationship between the overall risk of bias and sample size over time was evaluated using regression analyses, and RCTs were grouped into periods (epochs) of approximately 5 years.

RESULTS:

In total, 105 RCTs were included, of which 41 (39%) were considered to have a low risk of bias. There is significant improvement in the mean risk of bias over time ($P < .05$), which is the most profound for items related to selection bias and, to a lesser extent, attrition and selective outcome reporting bias. Furthermore, although there is no significant increase in sample size over time (overall $P = .8$), the proportion of studies that performed an a priori sample size calculation is increasing statistically (odds ratio, 2.1; confidence interval, 1.5-3.0). Sensitivity analyses suggest no appreciable difference between studies for neck or low back pain for risk of bias or sample size.

CONCLUSION:

Methodological quality of RCTs of SMT for neck and low back pain is improving, whereas overall sample size has shown only small and nonsignificant increases. There is an increasing trend among studies to conduct sample size calculations, which relate to statistical power. Based upon these findings, 7 areas of improvement for future SMT trials are suggested.

KEYWORDS:

Low Back Pain; Manipulation; Methodology; Neck Pain; Research; Sample Size; Spinal

PMID: 25194968

Manipulation and LBP

Osteopathic manipulative treatment for nonspecific low back pain: a systematic review and meta-analysis

Helge Franke¹, Jan-David Franke¹ and Gary Fryer^{23*}

BMC Musculoskeletal Disorders 2014

Abstract

Background

Nonspecific back pain is common, disabling, and costly. Therefore, we assessed effectiveness of osteopathic manipulative treatment (OMT) in the management of nonspecific low back pain (LBP) regarding pain and functional status.

Methods

A systematic literature search unrestricted by language was performed in October 2013 in electronic and ongoing trials databases. Searches of reference lists and personal communications identified additional studies. Only randomized clinical trials were included; specific back pain or single treatment techniques studies were excluded. Outcomes were pain and functional status. Studies were independently reviewed using a standardized form. The mean difference (MD) or standard mean difference (SMD) with 95% confidence intervals (CIs) and overall effect size were calculated at 3 months posttreatment. GRADE was used to assess quality of evidence.

Results

We identified 307 studies. Thirty-one were evaluated and 16 excluded. Of the 15 studies reviewed, 10 investigated effectiveness of OMT for nonspecific LBP, 3 effect of OMT for LBP in pregnant women, and 2 effect of OMT for LBP in postpartum women. Twelve had a low risk of bias. Moderate-quality evidence suggested OMT had a significant effect on pain relief (MD, -12.91; 95% CI, -20.00 to -5.82) and functional status (SMD, -0.36; 95% CI, -0.58 to -0.14) in acute and chronic nonspecific LBP. In chronic nonspecific LBP, moderate-quality evidence suggested a significant difference in favour of OMT regarding pain (MD, -14.93; 95% CI, -25.18 to -4.68) and functional status (SMD, -0.32; 95% CI, -0.58 to -0.07). For nonspecific LBP in pregnancy, low-quality evidence suggested a significant difference in favour of OMT for pain (MD, -23.01; 95% CI, -44.13 to -1.88) and functional status (SMD, -0.80; 95% CI, -1.36 to -0.23), whereas moderate-quality evidence suggested a significant difference in favour of OMT for pain (MD, -41.85; 95% CI, -49.43 to -34.27) and functional status (SMD, -1.78; 95% CI, -2.21 to -1.35) in nonspecific LBP postpartum.

Conclusion

Clinically relevant effects of OMT were found for reducing pain and improving functional status in patients with acute and chronic nonspecific LBP and for LBP in pregnant and postpartum women at 3 months posttreatment. However, larger, high-quality randomized controlled trials with robust comparison groups are recommended.

For headaches

J Headache Pain. 2014 Oct 2

Manual therapies for primary chronic headaches: a systematic review of randomized controlled trials.

Chaibi A¹, Russell MB.

Abstract

Purpose: This is to our knowledge the first systematic review regarding the efficacy of manual therapy randomized clinical trials (RCT) for primary chronic headaches.

Methods: A comprehensive English literature search on CINHAL, Cochrane, Medline, Ovid and PubMed identified 6 RCTs all investigating chronic tension-type headache (CTTH). One study applied massage therapy and five studies applied physiotherapy. Four studies were considered to be of good methodological quality by the PEDro scale. All studies were pragmatic or used no treatment as a control group, and only two studies avoided co-intervention, which may lead to possible bias and makes interpretation of the results more difficult.

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Conclusions: Future manual therapy RCTs are requested addressing the efficacy in chronic migraine with and without medication overuse. Future RCTs on headache should adhere to the International Headache Society's guidelines for clinical trials, i.e. frequency as primary end-point, while duration and intensity should be secondary end-point, avoid co-intervention, includes sufficient sample size and follow-up period for at least 6 months.

PMID: 25278005

STM/STRETCHING/MUSCLES

Trigger points

NeuroRehabilitation. 2014 Sep 23.

The hypoalgesic effect of remote tactile sensory modulation on the mechanical sensitivity of trigger points: A randomized controlled study.

Kim Y¹, Kim J¹, Shim JK², Suh DW³, Yoon B¹.

Abstract

BACKGROUND:

Sensitivity of the myofascial trigger point (MTrP) can be inhibited by electrical stimulation of remote site. However, it remains unclear whether remote pain control of the MTrP occurs in the same spinal segment or in the supraspinal system.

OBJECTIVES:

The aims of this study were to identify whether the remote pain control occurs in the spinal segment corresponding to the MTrP or in the supraspinal system.

METHODS:

Test subjects (n = 10) received transcutaneous electrical nerve stimulation for 5 minutes, whereas control subjects (n = 10) received no intervention. The threshold for tactile sensory modulation at the lateral elbow was assessed using Von Frey filaments. The pressure sensitivities of MTrPs in both the infraspinatus and upper trapezius muscles were quantified by algometry. Measurements were performed at baseline and 1 and 15 minutes after the intervention.

RESULTS:

Increases of the tactile threshold at the remote site decreased the sensitivity of the MTrP innervated by same spinal segment. However, no changes were observed at MTrP sites innervated by contralateral fibers or those from different spinal segment.

CONCLUSION:

MTrP sensitivity is more strongly affected by interventions at remote ipsilateral sites in the same spinal segment than by stimulation of extra-segmental sites.

KEYWORDS:

Remote pain control; hypoalgesia; myofascial trigger points; tactile sensory modulation; transcutaneous electrical nerve stimulation

PMID: 25248449

MUSCLES

Hamstring tear and PRP

Am J Sports Med. 2014 Oct. Epub 2014 Jul 29.

Platelet-rich plasma injections for the treatment of hamstring injuries: a randomized controlled trial.

A Hamid MS¹, Mohamed Ali MR², Yusof A³, George J⁴, Lee LP⁵.

Abstract

BACKGROUND:

A hamstring injury is one of the most common types of injury affecting athletes. Despite this, the optimal management of hamstring muscle injuries is not yet defined. The effect of autologous platelet-rich plasma (PRP) therapy on the recovery of hamstring injuries is unclear.

PURPOSE:

To investigate the effect of a single PRP injection in the treatment of grade 2 hamstring muscle injuries.

STUDY DESIGN:

Randomized controlled trial; Level of evidence, 2.

METHODS:

Twenty-eight patients diagnosed with an acute hamstring injury were randomly allocated to autologous PRP therapy combined with a rehabilitation program or a rehabilitation program only. The primary outcome of this study was time to return to play. In addition, changes in pain severity and pain interference scores over time were examined.

RESULTS:

Patients in the PRP group achieved full recovery significantly earlier than controls ($P = .02$). The mean time to return to play was 42.5 ± 20.6 days in the control group and 26.7 ± 7.0 days in the PRP group. Significantly lower pain severity scores were observed in the PRP group throughout the study. However, no significant difference in the pain interference score was found between the 2 groups.

CONCLUSION:

A single autologous PRP injection combined with a rehabilitation program was significantly more effective in treating hamstring injuries than a rehabilitation program alone.

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KEYWORDS:

management; muscle injury; platelet-rich plasma (PRP); return to play

PMID: 25073598

Adductor longus and Rectus

Clin Anat. 2013 May. Epub 2012 Jun 14.

Anatomical and mechanical relationship between the proximal attachment of adductor longus and the distal rectus sheath.

Norton-Old KJ1, Schache AG, Barker PJ, Clark RA, Harrison SM, Briggs CA.

Abstract

Purpose: The objectives of this study were to investigate the anatomical relationship between the proximal adductor longus (AL) and rectus abdominis muscles and to determine whether unilateral loading of AL results in strain transmission across the anterior pubic symphysis to the contralateral distal rectus sheath.

Methods: Bilateral dissections were conducted on 10 embalmed cadavers. Strain transfer across the pubic symphysis was examined on seven of these cadavers. An AL contraction was simulated by applying a controlled load in the direction of its proximal tendinous fibers, and the resultant strain in the contralateral distal rectus sheath was measured using a foil-type surface mounted microstrain gage. Adductor longus attached to the antero-inferior aspect of the pubis.

Results: In 18 of the 20 limbs, the proximal attachment of AL was tendinous on its superficial surface and muscular on its deep surface. The proximal AL tendon was found in most instances to have secondary communications with structures such as the contralateral distal rectus sheath, pubic symphysis anterior capsule, ilio-inguinal ligament, and contralateral proximal AL tendon. Despite these consistent anatomical observations, strain measured in the contralateral distal rectus sheath upon unilateral loading of the proximal AL varied considerably between cadavers.

Measured strain had an average \pm 1SD of $0.23 \pm 0.43\%$.

Conclusions: The proximal attachment of AL contributes to an anatomical pathway across the anterior pubic symphysis that is likely required to withstand the transmission of large forces during multidirectional athletic activities. This anatomical relationship may be a relevant factor in explaining the apparent vulnerability of the AL and rectus abdominis attachments to injury.

STRETCHING

Calf stretching program – supination

J Sport Rehabil. 2014 Oct 13

Gastrocnemius Stretching Program More Effective in Increasing Ankle/Rearfoot Dorsiflexion When Subtalar Joint Positioned in Pronation Compared to Supination.

Johanson MA¹, Armstrong M, Hopkins C, Keen ML, Robinson M, Stephenson S.

Abstract

CONTEXT:

Stretching exercises are commonly prescribed for patients and healthy individuals with limited extensibility of the gastrocnemius muscle.

OBJECTIVE:

The purpose of this study was to determine if individuals demonstrate more dorsiflexion at the ankle/rearfoot and less at the midfoot following a gastrocnemius stretching program with the subtalar joint (STJ) positioned in supination compared to pronation.

PARTICIPANTS:

22 volunteers with current or recent history of lower extremity cumulative trauma and gastrocnemius tightness (10 women and 4 men, mean age = 28 years) were randomly assigned to stretching groups with the STJ positioned in either pronation (n=11) or supination (n=11).

INTERVENTION:

3-week home gastrocnemius stretching program using a template to place the subtalar joint in either a pronated or supinated position.

MAIN OUTCOME MEASURES:

A 7-camera Vicon Motion Analysis System measured ankle/rearfoot dorsiflexion and midfoot dorsiflexion of all participants during stretching with the STJ positioned in both pronation and supination before and after the 3-week gastrocnemius stretching program.

RESULTS:

A two-way mixed model ANOVA revealed a significant interaction ($p=0.019$). At posttest, the group who performed the 3-week stretching program with the STJ positioned in pronation demonstrated increased ankle/rearfoot dorsiflexion when measured with the STJ in pronation than the group who performed the 3-week stretching program with the STJ positioned in supination. No significant main effect of stretching group or interaction for dorsiflexion at the midfoot was detected ($p=0.755$ and $p=0.820$, respectively).

CONCLUSION:

Following a 3-week gastrocnemius stretching program, when measuring dorsiflexion with the STJ positioned in supination, the participants who completed a 3-week gastrocnemius stretching program with the STJ positioned in pronation showed increased dorsiflexion at the ankle/rearfoot than participants who completed the stretching program with the STJ positioned in supination.

BET**Postural responses**

Man Ther. 2014 Oct. Epub 2014 Apr 24.

Altered postural responses persist following physical therapy of general versus specific trunk exercises in people with low back pain.

Lomond KV¹, Henry SM², Hitt JR², DeSarno MJ³, Bunn JY³.

Abstract

Purpose and Background: Interventions that target trunk muscle impairments in people with LBP have been promoted; however, the treatment effects on muscle activation impairments during postural tasks remain unclear. Thus, our objective was to evaluate the effects trunk stabilization vs. general strength and conditioning exercises on the automatic postural response in persons with chronic low back pain (LBP).

Methods: Fifty-eight subjects with chronic, recurrent LBP (n = 58) (i.e., longer than six months) were recruited and randomly assigned to one of two, 10-week physical therapy programs: stabilization (n = 29) or strength and conditioning (n = 29). Pain and function were measured at 11 weeks and 6 months post-treatment initiation. To quantify postural following support surface perturbations, surface electrodes recorded electromyography (EMG) of trunk and leg muscles and force plates recorded forces under the feet, to calculate the center of pressure.

Results: Both groups demonstrated significant improvements in pain and function out to 6 months. There were also changes in muscle activation patterns immediately post-treatment, but not at 6 months. However, changes in center of pressure (COP) responses were treatment specific. Following treatment, the stabilization group demonstrated later onset of COP displacement, while the onset of COP displacement in the strengthening group was significantly earlier following treatment.

Conclusions: Despite two different treatments, clinical improvements and muscle activation patterns were similar for both groups, indicating that the stabilization treatment protocol does not preferentially improve treatment outcomes or inter-muscle postural coordination patterns for persons with LBP.

KEYWORDS: Electromyography; Low back pain (LBP); Physical therapy; Posture

PMID: 24853255

Lumbopelvic coordination

Man Ther. 2014 Oct; Epub 2014 Mar 30.

A clinical test of lumbopelvic control: development and reliability of a clinical test of dissociation of lumbopelvic and thoracolumbar motion.

Elgueta-Cancino E¹, Schabrun S¹, Danneels L², Hodges P³.

Abstract

Purpose: LBP is often associated with changes in motor control. Some subgroups of LBP have been argued to have a compromised ability to dissociate lumbopelvic movement from that of the thoracolumbar junction. Clinical methods to evaluate this task may aid identification of this LBP subgroup and determine the utility of this information to guide clinical interventions. The study aimed to develop a clinical test to assess the ability to dissociate lumbopelvic movement from that of the thoracolumbar junction, and to evaluate the inter-rater reliability of the test in individuals with and without low back pain (LBP) when performed by experienced and novice therapists.

Method: A clinical scale was developed to characterise quality of performance of lumbopelvic motion with limited motion at the thoracolumbar junction. Inter-tester repeatability was measured in three experiments. Test outcomes for pain-free controls were compared between three assessors with different amounts of clinical experience. Test scores for LBP participants were compared between two assessors, and between assessments undertaken from video recordings. Agreement between assessors was tested with weighted Kappa Coefficient.

Results: The test had acceptable reliability in pain-free and LBP participants, but was better when undertaken by experienced therapists. Kappa index ranged from 0.81 to 0.66 for live assessments, and 0.62 for video assessments.

Conclusions: The results showed that the test is reliable when performed by experienced assessors. The test can assess thoracolumbar movements in different groups of individuals.

KEYWORDS:

Low back pain; Movement test; Reliability; Thoracolumbar dissociation

PMID: 24853256

Stick exercises and hip hinging

J Back Musculoskelet Rehabil. 2014 Sep 29

The effects of an exercise with a stick on the lumbar spine and hip movement patterns during forward bending in patients with lumbar flexion syndrome.

Yoon JY¹, Kim JW¹, Kang MH¹, An DH², Oh JS².

Abstract**BACKGROUND AND OBJECTIVE:**

Forward bending is frequently performed in daily activities. However, excessive lumbar flexion during forward bending has been reported as a risk factor for low back pain. Therefore, we examined the effects of an exercise strategy using a stick on the angular displacement and movement onset of lumbar and hip flexion during forward-bending exercises in patients with lumbar flexion syndrome. **METHODS:** Eighteen volunteers with lumbar flexion syndrome were recruited in this study. Subjects performed forward-bending exercises with and without a straight stick in standing. The angular displacement and movement onset of lumbar and hip flexion during forward-bending exercises were measured by using a three dimensional motion analysis system. The significances of differences between the two conditions (with stick vs. without stick) was assessed using a one-way repeated analysis of variance.

RESULTS:

When using a stick during a forward-bending exercise, the peak angular displacement of lumbar flexion decreased significantly, and those of right and left-hip flexion increased significantly compared with those without a stick. The movement onset of lumbar flexion occurred significantly later, and the onset of right-hip flexion occurred significantly earlier with than without a stick. **CONCLUSIONS:** Based on these findings, a stick exercise was an effective method to prevent excessive lumbar flexion and more helpful in developing hip flexion during a forward-bending exercise. These findings will be useful for clinicians to teach self-exercise during forward bending in patients with lumbar flexion syndrome.

KEYWORDS:

Stick exercise; forward bending; lumbar flexion syndrome; movement impairment syndrome

PMID: 25271198

CORE

TA/PNF

J Phys Ther Sci. 2014 Sep;26. Epub 2014 Sep 17.

The intervention effects of different treatments for chronic low back pain as assessed by the thickness of the musculus transversus abdominis.

Huang Q¹, Li D¹, Zhang Y², Rui G³, Huo M², Maruyama H².

Abstract

[Purpose] The purpose of this study was to examine the immediate effects of an intervention comprising proprioceptive neuromuscular facilitation (PNF) or neuromuscular joint facilitation (NJF) on chronic low back pain as assessed by the thickness of musculus transversus abdominis [Subjects] The subjects were 12 young people (five males, seven females) who had chronic low back pain on one side for more than 6 months. [Methods] Subjects were asked to lie their sides with the painful side facing up. The subjects received PNF or NJF exercise treatments. The changes in the musculus transversus abdominis thickness were measured using ultrasonography. **[Result]** The thickness of the musculus transversus abdominis in the NJF group increased significantly and was higher than that in the PNF group and at rest.

[Conclusion] The results showed that significantly better improvement can be obtained for chronic low back pain by applying NJF patterns to the musculus transversus abdominis.

KEYWORDS:

Low back pain; Musculus transversus abdominis; Neuromuscular joint facilitation (NJF)

PMID: 25276020

Core program

Clin Rehabil. 2014 Sep 29.

The effects of the CORE programme on pain at rest, movement-induced and secondary pain, active range of motion, and proprioception in female office workers with chronic low back pain: a randomized controlled trial.

Kim TH¹, Kim EH², Cho HY³.

Abstract**OBJECTIVE:**

To investigate the effects of the CORE programme on pain at rest, movement-induced pain, secondary pain, active range of motion, and proprioception deficits in female office workers with chronic low back pain.

SUBJECTS:

A total of 53 participants with chronic low back pain were randomized into the CORE group and the control group.

INTERVENTION:

CORE group participants underwent the 30-minute CORE programme, five times per week, for eight weeks, with additional use of hot-packs and transcutaneous electrical nerve stimulation, while the control group used only hot-packs and transcutaneous electrical nerve stimulation.

MAIN MEASURES:

Participants were evaluated pretest, posttest, and two months after the intervention period to measure resting and movement-induced pain, pressure pain as secondary pain, active range of pain-free motion, and trunk proprioception.

RESULTS:

Pain intensity at rest (35.6 ± 5.9 mm) and during movement (39.4 ± 9.1 mm) was significantly decreased in the CORE group following intervention compared with the control group. There were significant improvements in pressure pain thresholds (quadratus lumborum: 2.2 ± 0.7 kg/cm²; sacroiliac joint: 2.0 ± 0.7 kg/cm²), active range of motion (flexion: $30.8 \pm 14.3^\circ$; extension: $6.6 \pm 2.5^\circ$), and proprioception (20° flexion: $4.3 \pm 2.4^\circ$; 10° extension: $3.1 \pm 2.0^\circ$) in the CORE group following intervention (all $p < 0.05$). These improvements were maintained at the two-month follow-up. The control group did not show significant improvements in any measured parameter.

CONCLUSION:

The CORE programme is an effective intervention for reducing pain at rest and movement-induced pain, and for improving the active range of motion and trunk proprioception in female office workers with chronic low back pain.

KEYWORDS:

CORE programme; Movement-induced pain; active range of motion; chronic low back pain; proprioception

PMID: 25269569

ATHLETICS

Adolescent female soccer injuries

Am J Sports Med. 2014 Oct. Epub 2014 Jul 2.

High injury incidence in adolescent female soccer.

Clausen MB¹, Zebis MK², Møller M³, Krustrup P⁴, Hölmich P⁵, Wedderkopp N⁶, Andersen LL⁷, Christensen KB⁸, Thorborg K⁵.

Abstract

BACKGROUND:

Previous studies report varying rates of time-loss injuries in adolescent female soccer, ranging from 2.4 to 5.3 per 1000 athlete-exposures or 2.5 to 3.7 per 1000 hours of exposure. However, these studies collected data using traditional injury reports from coaches or medical staff, with methods that significantly underestimate injury rates compared with players' self-reports.

PURPOSE:

The primary aim was to investigate the injury incidence in adolescent female soccer using self-reports via mobile telephone text messaging. The secondary aim was to explore the association between soccer exposure, playing level, and injury risk.

METHODS:

During a full adolescent female soccer season in Denmark (February-June 2012), a population-based sample of 498 girls aged 15 to 18 years was included in the prospective registration of injuries. All players were enrolled on a team participating in Danish Football Association series. Soccer injuries and exposure were reported weekly by answers to standardized text message questions, followed by individual injury interviews. Soccer exposure and playing levels were chosen a priori as the only independent variables of interest in the risk factor analyses. Injury rates and relative risks were estimated using Poisson regression. Generalized estimation equations were used to take into account that players were clustered within teams.

RESULTS:

There were 498 players who sustained a total of 424 soccer injuries. The incidence of injuries was 15.3 (95% CI, 13.1-17.8), the incidence of time-loss injuries was 9.7 (95% CI, 8.2-11.4), and the incidence of severe injuries was 1.1 (95% CI, 0.7-1.6) per 1000 hours of soccer exposure. Higher average exposure in injury-free weeks was associated with a lower injury risk (P value for trend <.001), and players with low exposure (≤ 1 h/wk) were 3 to 10 times more likely to sustain a time-loss injury compared with other players (P < .01). Playing level was not associated with the risk of time-loss injuries (P = .18).

CONCLUSION:

The injury incidence in adolescent female soccer is high, and this includes many severe injuries. Players with low soccer participation (≤ 1 h/wk) have a significantly higher injury risk compared with players participating more frequently.

KEYWORDS: incidence; injury; soccer; text messaging

PMID: 2498949

Adolescent pitchers hips and shoulders

Am J Sports Med. 2014 Oct. Epub 2014 Aug 5.

Clinical assessment of scapula and hip joint function in preadolescent and adolescent baseball players.

Beckett M¹, Hannon M², Ropiak C¹, Gerona C¹, Mohr K¹, Limpisvasti O¹.

Abstract

BACKGROUND:

Proper scapulohoracic and hip mechanics are essential aspects of the throwing kinetic chain. Little is known regarding these entities in preadolescent and adolescent baseball players.

HYPOTHESIS:

Scapular malposition and dyskinesia as well as hip dysfunction are highly prevalent in preadolescent and adolescent baseball players and may be identified by simple clinical testing.

METHODS:

A total of 112 baseball players aged 7 to 18 years were recruited from local Little Leagues, traveling teams, and high schools. Participants were divided into 2 groups: preadolescents (players aged 7-12 years) and adolescents (players aged 13-18 years). Scapular symmetry was tested with the yes/no method of Kibler and by measuring forward shoulder posture via the "coracoid distance." Hip abductor strength was measured by use of a handheld digital dynamometer. Functional gluteal and core strength was assessed by video analysis of the subjects performing the single-legged squat test. Hip range of motion was measured in the prone position by use of a handheld goniometer.

RESULTS:

Compared with the preadolescent group, the adolescent group had a significantly higher prevalence of scapular dyskinesia in the throwing shoulder (50% vs 25.9%, $P = .011$). The adolescents had significantly higher normalized hip abduction strength in both the stride (17.41 vs 12.62 N/kg, $P < .001$) and stance (17.82 vs 12.61 N/kg, $P < .001$) legs. The preadolescent group was unable to perform the single-legged squat test correctly in either the stance (0% preadolescent vs 13% adolescent, $P = .0127$) or stride (0% preadolescent vs 9.3% adolescent, $P = .0567$) leg. The mean coracoid distance was elevated in the dominant (throwing) shoulder after controlling for scapular dyskinesia ($P < .0001$). Presence of scapular dyskinesia was associated with a higher mean coracoid distance ($P = .0067$).

CONCLUSION:

There was a high prevalence of dominant shoulder scapular dyskinesia in the adolescent compared with the preadolescent group, as well as universally poor single-legged squat test performance. The mean coracoid distance was higher in the dominant or throwing side compared with the nondominant side independent of scapular dyskinesia. Presence of scapular dyskinesia was associated with higher mean coracoid distance.

CLINICAL RELEVANCE:

Identification of players thought to be at increased risk for throwing injuries and initiation of targeted rehabilitation programs may decrease injury rates in preadolescent and adolescent baseball players.

Adolescent pitchers' shoulders

Radiology. 2014 Oct 14

Acromial Apophysiolysis: Superior Shoulder Pain and Acromial Nonfusion in the Young Throwing Athlete.

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Abstract

Purpose: To describe the frequency of acromial apophysiolysis and its association with incomplete fusion and superior shoulder pain, to determine risk factors of acromial apophysiolysis, and to assess whether acromial apophysiolysis is associated with the development of an os acromiale and rotator cuff tears.

Materials and Methods: Institutional review board approval was obtained for this HIPAA-compliant study; requirement for informed consent was waived. A retrospective report review of 2372 consecutive patients between 15 and 25 years of age who underwent shoulder magnetic resonance (MR) imaging for shoulder pain was performed. Individuals with edema at the acromial apophyses and no other abnormalities on MR images were included in the study group. Association of acromial edema with incomplete fusion, pitching, and clinical findings was determined in the study group and in an age- and sex-matched control group, with both univariate and multivariate binary logistic regression analyses. Association with the development of an os acromiale and rotator cuff tears later in life was assessed with follow-up imaging after age 25 years.

Results: Edema at the acromial apophyses was found in 2.6% (61 of 2372) of patients and was associated with incomplete fusion of the acromial apophyses (χ^2 , $P < .001$) and superior shoulder tenderness ($P < .001$). The entity was named acromial apophysiolysis. A pitch count of more than 100 pitches per week was shown to be a risk factor for acromial apophysiolysis (odds ratio [OR odds ratio] = 6.5, $P = .017$). Follow-up imaging showed that acromial apophysiolysis was significantly associated with the development of an os acromiale (OR odds ratio = 138, $P < .001$) and rotator cuff tears (OR odds ratio = 5.4, $P = .015$) after age 25 years.

Conclusion: Acromial apophysiolysis is characterized by incomplete fusion and edema at the acromial apophyses. It is associated with superior shoulder pain in young patients (< 25 years old), and pitching is a risk factor. It predisposes the patient to the development of an os acromiale and rotator cuff tears after age 25 years. © RSNA, 2014.

PMID: 25314006

RUNNING

Compression socks and marathon runners

J Strength Cond Res. 2014 Sep 2

COMPRESSION SOCKS AND FUNCTIONAL RECOVERY FOLLOWING MARATHON RUNNING: A RANDOMISED CONTROLLED TRIAL.

Armstrong SA1, Till ES, Maloney S, Harris G.

Abstract

Purpose: Compression socks have become a popular recovery aid for distance running athletes. Although some physiological markers have been shown to be influenced by wearing these garments, scant evidence exists on their effects on functional recovery.

Methods: This research aims to shed light onto whether the wearing of compression socks for 48 hours after marathon running can improve functional recovery, as measured by a timed treadmill test to exhaustion 14 days following marathon running. Athletes (n=33, age = 38.5 ±7.2yrs) participating in the 2012 Melbourne, 2013 Canberra or 2013 Gold Coast marathons were recruited and randomised into the compression sock or placebo group. A graded treadmill test to exhaustion was performed 2 weeks prior and 2 weeks following each marathon. Time to exhaustion, average and maximum heart rates were recorded. Participants were asked to wear their socks for 48 hours immediately after completion of the marathon. The change in treadmill times (seconds) was recorded for each participant. 33 participants completed the treadmill protocols.

Results: In the compression group, average treadmill run to exhaustion time 2 weeks following the marathon increased by 2.6% (52s ±103s). In the placebo group, run to exhaustion time decreased by 3.4% (-62s ±130s). P=0.009.

Conclusions: This shows a significant beneficial effect of compression socks on recovery compared to placebo. The wearing of below knee compression socks for 48 hours after marathon running has been shown to improve functional recovery as measured by a graduated treadmill test to exhaustion 2 weeks following the event.

PAIN**Acupuncture and pain**

Pain Manag Nurs. 2014 Jun;15. Epub 2013 Feb 15.

The effectiveness of acupressure on relieving pain: a systematic review.

Chen YW¹, Wang HH².

Abstract

Purpose: Acupressure is a complementary treatment that uses fingers and hands to stimulate acupoints and maintains the balance of energy. The objective of this study was to review the application of acupressure in managing different pains and the effectiveness of acupressure on relieving pain in various settings.

Methods: A systematic review of English articles using the databases of MEDLINE, PubMed, and Cumulative Index to Nursing and Allied Health Literature (CINAHL) was performed using the search terms of "acupressure" and "pain." Studies during which acupressure was applied as an intervention and assessed for its effectiveness on relieving pain were selected. The studies selected were those published from January 1, 1996 to December 31, 2011 that met the inclusion and exclusion criteria. The participants included patients with dysmenorrhea, labor pain, low back pain, chronic headache, and other traumatic pains. The Oxford 2011 Levels of Evidence was used to appraise the literature. Fifteen studies were extracted for reducing dysmenorrhea (menstrual distress), labor pain, low back pain, chronic headache, and other traumatic pain. These papers were further reviewed for their study design, adequacy of randomization and concealment of allocation, blinding of participants, interventions, and outcome measurements.

Results and Conclusions: Acupressure has been shown to be effective for relieving a variety of pains in different populations. The review begins to establish a credible evidence base for the use of acupressure in pain relief. The implication for health care providers would be incorporating acupressure into their practice as an alternative therapy to facilitate patients who suffer from pain.

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Verbal suggestions and HA

Cephalalgia. 2014 Oct 10.

Contribution of verbal suggestion to the therapeutic efficacy of an analgesic agent for acute primary headache.

Oktay C¹, Eken C², Goksu E², Dora B³.

Abstract**OBJECTIVE:**

The therapeutic response of a patient cannot purely be explained by the method of therapy or the efficacy of a drug. Clinician-patient interaction, psychosocial factors, patients' expectations, hopes, beliefs and fears are all related to the healing outcome. Malleability and suggestibility are also important in the placebo or nocebo effect. The purpose of this study was to evaluate whether adding brief verbal suggestions for pain relief could change the magnitude of an analgesic's efficacy.

METHODS:

This prospective study was performed in the emergency department of a university hospital. Patients who were ordered analgesia with diclofenac sodium for primary headache were divided into three groups. All groups were informed that they would be administered a pain killer by intramuscular injection. The second and third groups were given positive and reduced treatment expectations about the therapeutic efficacy, respectively. Patients were asked to rate their pain on a VAS at 0 and 45 minutes and if they needed any additional analgesic 45 minutes after the injection.

RESULTS:

A total of 153 patients were included in the study. The paired univariate analyses showed significant differences for all groups between 0- and 45-minute VAS scores. However, there was no difference between the three groups according to the differences in VAS scores between 45 and 0 minutes and according to the administration of an additional drug.

CONCLUSION:

Simple verbal suggestions did not alter the efficacy of an analgesic agent for headache in an emergency setting. The contributions of suggestibility, desire and expectation in acute primary headache patients should be further investigated.

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KEYWORDS:

Verbal suggestions; analgesia; emergency department; expectancy; headache; nocebo; placebo

PMID: 25304763

Placebo and neuropathic pain

Pain. 2014 Oct 1.

Expectations and positive emotional feelings accompany reductions in ongoing and evoked neuropathic pain following placebo interventions.

Petersen GL¹, Finnerup NB², Grosen K³, Pilegaard HK³, Tracey I⁴, Benedetti F⁵, Price DD⁶, Jensen TS², Vase L⁷.

Abstract

Purpose: Research on placebo analgesia and nocebo hyperalgesia has primarily included healthy subjects or acute pain patients, and it is unknown whether these effects can be obtained in ongoing pain in patients with chronic pain caused by an identifiable nerve injury.

Methods: Eighteen patients with post-thoracotomy neuropathic pain were exposed to placebo and nocebo manipulations, in which they received open and hidden administrations of pain-relieving (lidocaine) or pain-inducing (capsaicin) treatment controlled for the natural history of pain. Immediately after the open administration, patients rated their expected pain levels on a mechanical visual analogue scale (M-VAS). They also reported their emotional feelings via a quantitative/qualitative experiential method. Subsequently, patients rated their ongoing pain levels on the M-VAS and underwent quantitative sensory testing (QST) of evoked pain (brush, pinprick, area of hyperalgesia, wind-up-like pain).

Results: There was a significant placebo effect on both ongoing ($P = 0.009-0.019$) and evoked neuropathic pain ($P = 0.0005-0.053$). Expected pain levels accounted for significant amounts of the variance in ongoing (53.4%) and evoked pain (up to 34.5%) following the open lidocaine administration. Furthermore, patients reported high levels of positive and low levels of negative

emotional feelings in the placebo condition compared with the nocebo condition ($P \leq 0.001$).

Pain increases during nocebo were non-significant ($P = 0.394-1.000$).

Conclusions: This is the first study to demonstrate placebo effects in ongoing neuropathic pain. It provides further evidence for placebo-induced reduction in hyperalgesia and suggests that patients' expectations co-exist with emotional feelings about treatments.

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KEYWORDS:

Emotional feelings; Expectation; Neuropathic pain; Nocebo hyperalgesia; Placebo analgesia

PMID: 25281929

Smoking and chronic pain

Smoking increases risk of pain chronification through shared corticostriatal circuitry

Human Brain Mapping, 10/13/2014 Clinical Article

Petre B, et al. – The authors examined the relationship between smoking, transition to chronic pain, and brain physiology. They conclude that smoking increases risk of transitioning to chronic back pain, an effect mediated by corticostriatal circuitry involved in addictive behavior and motivated learning.

Abstract

Purpose: Smoking is associated with increased incidence of chronic pain. However, the evidence is cross-sectional in nature, and underlying mechanisms remain unclear.

Methods: In a longitudinal observational study, we examined the relationship between smoking, transition to chronic pain, and brain physiology. In 160 subjects with subacute back pain (SBP: back pain lasting 4–12 weeks, and no prior back pain [BP] for at least 1 year) pain characteristics, smoking status, and brain functional properties were measured repeatedly over 1 year. Sixty-eight completed the study, subdivided into recovering (SBPr, $n = 31$) and persisting (SBPp, $n = 37$), based on >20% decrease in BP over the year. Thirty-two chronic back pain (CBP: duration > 5 years) and 35 healthy controls were similarly monitored.

Results: Smoking prevalence was higher in SBP and CBP but not related to intensity of BP. In SBP, smoking status at baseline was predictive of persistence of BP 1 year from symptom onset (differentiating SBPp and SBPr with 0.62 accuracy). Smoking status combined with affective properties of pain and medication use improved prediction accuracy (0.82). Mediation analysis indicated the prediction of BP persistence by smoking was largely due to synchrony of fMRI activity between two brain areas (nucleus accumbens and medial prefrontal cortex, NAc-mPFC). In SBP or CBP who ceased smoking strength of NAc-mPFC decreased from precessation to postcessation of smoking.

Conclusions: We conclude that smoking increases risk of transitioning to CBP, an effect mediated by corticostriatal circuitry involved in addictive behavior and motivated learning.

COMPLEX REGIONAL PAIN

Optokinetic stimulation

Optokinetic stimulation increases limb pain and forehead hyperalgesia in complex regional pain syndrome

European Journal of Pain, 10/17/2014 Clinical Article

Knudsen LF, et al.

Abstract

Background

Ambiguous visual stimuli increase limb pain in patients with complex regional pain syndrome (CRPS), possibly due to afferent sensory feedback conflicts. Conflicting sensory stimuli can also generate unpleasant sensations in healthy people such as during motion sickness. We wanted to investigate the mechanisms underlying the link between sensory conflicts and pain in CRPS using optokinetic stimulation (OKS) – a method known to induce motion sickness.

Methods

Twenty-one CRPS patients underwent OKS and rated symptoms of motion sickness. Patients also rated limb pain and pain-related distress before, during and after OKS. In addition, pressure-pain and sharpness sensations were investigated on both sides of the forehead and in the affected and contralateral limb before and after OKS.

Results

Limb pain and forehead hyperalgesia to pressure increased in parallel in response to OKS. In a subgroup of nauseated patients who withdrew early from OKS, hyperalgesia to pressure in the ipsilateral forehead persisted longer than in the remaining participants. Sharpness sensations remained constant at all sites.

Conclusions

Sensory conflicts may facilitate pain in CRPS by activating the mechanisms of general facilitation of nociception and, during more severe sensory conflicts, also a facilitatory mechanism that operates mainly ipsilateral to the affected limb.

FIBROMYALGIA

Vit. D and RA and FM

Int J Rheum Dis. 2014 Oct 7.

Vitamin D status in rheumatoid arthritis patients: relation to clinical manifestations, disease activity, quality of life and fibromyalgia syndrome.

Gheita TA¹, Sayed S, Gheita HA, Kenawy SA.

Abstract

AIM:

To assess vitamin D levels in rheumatoid arthritis (RA) patients and to find their relation to clinical parameters, fibromyalgia syndrome (FMS), quality of life (QoL) and disease activity.

METHODS:

The study included 63 RA patients and 62 controls. Clinical examination and laboratory investigations were performed. For patients, the Disease Activity Score (DAS-28), QoL index, Health Assessment Questionnaire II (HAQ II) and Modified Larsen score were calculated. 25-OH-vitamin D was measured in patients and controls.

RESULTS:

The patients' mean age was 41.59 ± 9.69 years and disease duration 5.89 ± 3.67 years. The level of vitamin D in RA patients was significantly lower (23.11 ± 12.71 ng/mL) than that in the controls (32.59 ± 13.06 ng/mL) ($P = 0.005$) being deficient in 50.8%, insufficient in 23.8% and normal in 25.4%. The RA patients with FMS ($n = 33$) had significantly lower levels of vitamin D (19.08 ± 10.59 ng/mL) than those without (27.55 ± 13.51 ng/mL) ($P = 0.008$). The difference was significant on comparing those receiving hydroxychloroquine (17.39 ± 7.84 ng/mL) to those not (31.85 ± 13.85 ng/mL) ($P < 0.001$). Vitamin D significantly correlated with QoL index ($r = 0.58$, $P < 0.001$) and negatively with HAQ II ($r = -0.36$, $P = 0.004$) and BMI ($r = -0.39$, $P = 0.001$).

CONCLUSION:

Special attention is required regarding vitamin D levels in RA patients with FMS and decreased QoL. Vitamin D should be corrected and supplementation considered among the RA management armamentarium.

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KEYWORDS:

HAQ II; QoL; disease activity (DAS-28); fibromyalgia syndrome; rheumatoid arthritis; vitamin D

PMID: 2529124

NEUROLOGICAL CONDITIONS

Respiratory training in SCI

Phys Ther. 2014 Jul 31.

Resistive Inspiratory Muscle Training in People With Spinal Cord Injury During Inpatient Rehabilitation: A Randomized Controlled Trial.

Postma K¹, Haisma JA², Hopman MT³, Bergen MP⁴, Stam HJ⁵, Busmann JB⁶.

Abstract

BACKGROUND AND OBJECTIVE:

People with spinal cord injury (SCI) may benefit from resistive inspiratory muscle training (RIMT). Current evidence is weak, and little is known about the effect on functional outcomes and long-term effects. The purpose of this study was to assess immediate and long-term effects of RIMT in people with SCI.

PATIENTS:

The study participants were 40 people with SCI (15 with motor complete tetraplegia, 16 with incomplete tetraplegia, 8 with motor complete paraplegia, and 1 with incomplete paraplegia) who had impaired pulmonary function and were admitted for initial inpatient rehabilitation.

INTERVENTION:

Study participants were randomized to an RIMT group or a control group. All participants received usual rehabilitation care. In addition, participants in the intervention group performed RIMT with a threshold trainer.

MEASUREMENTS:

Measurements were performed at baseline, after 8 weeks of intervention, 8 weeks later, and 1 year after discharge from inpatient rehabilitation. Primary outcome measures were: respiratory muscle function, lung volumes and flows, and perceived respiratory function. Secondary outcome measures concerned patient functioning, which included health-related quality of life, limitations in daily life due to respiratory problems, and respiratory complications.

RESULTS:

During the intervention period, maximum inspiratory pressure (MIP) improved more in the RIMT group than in the control group (11.7 cm H₂O, 95% confidence interval=4.3 to 19.0). At follow-up, this effect was no longer significant. No effect on other primary or secondary outcome measures was found except for an immediate effect on mental health.

LIMITATIONS:

The sample size was insufficient to study effects on respiratory complications.

CONCLUSIONS:

Resistive inspiratory muscle training has a positive short-term effect on inspiratory muscle function in people with SCI who have impaired pulmonary function during inpatient rehabilitation.

PMID: 25082923