

ABSTRACTS

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LUMBAR SPINE

LBP

CPR and LBP

Validation and impact analysis of prognostic clinical prediction rules for low back pain is needed: a systematic review

Journal of Clinical Epidemiology, 03/06/2015 Haskins R, et al.

The aim of this study is to identify prognostic forms of clinical prediction rules (CPRs) related to the non-surgical management of adults with low back pain (LBP) and to evaluate their current stage of development. The majority of the identified prognostic CPRs for LBP are in the initial phase of development and are consequently not recommended for direct application in clinical practice at this time.

Methods

- Systematic review using a sensitive search strategy across 7 databases with hand-searching and citation tracking.

Results

- 10,005 records were screened for eligibility with 35 studies included in the review.
- The included studies report on the development of 30 prognostic LBP CPRs.
- The majority of the identified CPRs are in their initial phase of development.
- Three CPRs were found to have undergone validation – the Cassandra rule for predicting long-term significant functional limitations and the 5-item and 2-item Flynn manipulation CPRs for predicting a favourable functional prognosis in patients being treated with lumbopelvic manipulation.
- No studies were identified that investigated whether the implementation of a CPR resulted in beneficial patient outcomes or improved resource efficiencies.

LBP progression

Spine J. 2015 Feb 10. pii: S1529-9430(15)00110-2. doi: 10.1016/j.spinee.2015.02.012.

Patients with low back pain had distinct clinical course patterns that were typically neither complete recovery nor constant pain. A Latent Class Analysis of longitudinal data.

Kongsted A¹, Kent P², Hestbaek L³, Vach W⁴.
Author information

Abstract

BACKGROUND CONTEXT:

The clinical presentation and outcome of patients with non-specific low back pain (LBP) are very heterogeneous and may be better understood by the recognition of reproducible subgroups. One approach to subgrouping is the identification of clinical course patterns (trajectories). However, it has been unclear how dependent these trajectories are on the analytical model used and the pain characteristics included.

PURPOSE:

To identify LBP trajectories using LBP intensity and LBP frequency measured once a week over one year, and compare results obtained using different analytical approaches.

STUDY DESIGN:

Prospective observational cohort study. Patient Sample Patients presenting with non-specific LBP to general practitioners and chiropractors.

OUTCOME MEASURES:

Weekly self-report of LBP intensity (0-10) and number of LBP days, measured by SMS cell phone questions over a one year follow-up period.

METHODS:

Latent Class Analysis was used to identify trajectories of LBP and 12 different analytical models were compared. The study was a component of a broader study funded by an unrestricted grant from the Danish Chiropractors' Foundation (USD 370,000). The funder of this study had no capacity to influence the scholarly conduct of the research, interpretation of results or the dissemination of study outcomes.

RESULTS:

The study included 1,082 patients. The 12 models resulted in five to 12 subgroups, with a number of trajectories stable across models that differed on pain intensity, number of LBP days, and shape of trajectory.

CONCLUSIONS:

The clinical course of LBP is complex. Most primary care patients do not become pain-free within a year, but only a small proportion reports constant severe pain. Some distinct patterns exist that were identified independently of the way the outcome was modelled. These patterns would not be revealed by using the simple summary measures traditionally applied in LBP research or when describing a patient's pain history only in terms of duration. The appropriate number of subgroups will depend on the intended purpose of subgrouping.

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PMID: 25681230

Chinese management of LBP and Neck pain

PLoS One. 2015 Feb 24;10(2):e0117146. doi: 10.1371/journal.pone.0117146. eCollection 2015.

Traditional chinese medicine for neck pain and low back pain: a systematic review and meta-analysis.

Yuan QL¹, Guo TM², Liu L¹, Sun F³, Zhang YG¹.

Author information

Abstract

BACKGROUND:

Neck pain (NP) and low back pain (LBP) are common symptoms bothering people in daily life. Traditional Chinese medicine (TCM) has been used to treat various symptoms and diseases in China and has been demonstrated to be effective. The objective of the present study was to review and analyze the existing data about pain and disability in TCM treatments for NP and LBP.

METHODS:

Studies were identified by a comprehensive search of databases, such as MEDLINE, EMBASE, and Cochrane Library, up to September 1, 2013. A meta-analysis was performed to evaluate the efficacy and safety of TCM in managing NP and LBP.

RESULTS:

Seventy five randomized controlled trials (n = 11077) were included. Almost all of the studies investigated individuals experiencing chronic NP (CNP) or chronic LBP (CLBP). We found moderate evidence that acupuncture was more effective than sham-acupuncture in reducing pain immediately post-treatment for CNP (visual analogue scale (VAS) 10 cm, mean difference (MD) = -0.58 (-0.94, -0.22), 95% confidence interval, p = 0.01), CLBP (standardized mean difference = -0.47 (-0.77, -0.17), p = 0.003), and acute LBP (VAS 10 cm, MD = -0.99 (-1.24, -0.73), p < 0.001). Cupping could be more effective than waitlist in VAS (100 mm) (MD = -19.10 (-27.61, -10.58), p < 0.001) for CNP or medications (e.g. NSAID) for CLBP (MD = -5.4 (-8.9, -0.19), p = 0.003). No serious or life-threatening adverse effects were found.

CONCLUSIONS:

Acupuncture, acupuncture, and cupping could be efficacious in treating the pain and disability associated with CNP or CLBP in the immediate term. Gua sha, tai chi, qigong, and Chinese manipulation showed fair effects, but we were unable to draw any definite conclusions, and further research is still needed. The efficacy of tuina and moxibustion is unknown because no direct evidence was obtained. These TCM modalities are relatively safe.

PMID:25710765

Obesity and LBP**The association between obesity and back pain in nine countries: a cross-sectional study**

BMC Public Health, 03/02/2015

Koyanagi A et al.

The strength of the association between obesity and back pain may vary by country. Future studies are needed to determine the factors contributing to differences in the associations observed.

Methods

- Data on 42116 individuals ≥ 50 years who participated in the Collaborative Research on Ageing in Europe (COURAGE) study conducted in Finland, Poland, and Spain in 2011–2012, and the World Health Organization's Study on Global Ageing and Adult Health (SAGE) conducted in China, Ghana, India, Mexico, Russia, and South Africa in 2007–2010 were analysed.
- Information on measured height and weight available in the two datasets was used to calculate Body Mass Index (BMI).
- Self-reported back pain occurring in the past 30 days was the outcome.
- Multivariable logistic regression analysis was used to assess the association between BMI and back pain.

Results

- The prevalence of back pain ranged from 21.5% (China) to 57.5% (Poland).
- In the multivariable analysis, compared to BMI 18.5–24.9 kg/m², significantly higher odds for back pain were observed for BMI ≥ 35 kg/m² in Finland (OR 3.33), Russia (OR 2.20), Poland (OR 2.03), Spain (OR 1.56), and South Africa (OR 1.48); BMI 30.0–34.0 kg/m² in Russia (OR 2.76), South Africa (OR 1.51), and Poland (OR 1.47); and BMI 25.0–29.9 kg/m² in Russia (OR 1.51) and Poland (OR 1.40).
- No significant associations were found in the other countries.

Predicting outcomes of radicular symptoms

Outcome prediction in chronic unilateral lumbar radiculopathy: Prospective cohort study **BMC Musculoskeletal Disorders, 03/02/2015 Iversen T, et al.**

To better understand the clinical course of chronic unilateral lumbar radiculopathy and to assist clinical decision-making, researchers sought to identify clinically relevant predictors for outcome at 52 weeks. They found that lower age, higher education, working full-time, and low fear avoidance beliefs all predicted a better outcome of chronic unilateral lumbar radiculopathy. Lower age and low fear avoidance, specifically, predicted better functional outcome and less back pain, and higher education and working full-time predict less leg pain.

Methods

- For this sham controlled clinical trial of epidural injection of glucocorticoids, researchers enrolled 116 patients with chronic unilateral lumbar radiculopathy.
- They defined success at follow-up as ≤ 17.5 for visual analogue scale (VAS) leg pain, ≤ 22.5 for VAS back pain and ≤ 20 for Oswestry Disability Index (ODI).
- They measured 15 clinically relevant variables, which included demographic, psychosocial, clinical and radiological data, and analysed them with logistic multivariable regression.

Results

- At follow-up, 75 (64.7%) patients had reached a successful outcome, with an ODI score ≤ 20 , 54 (46.6%) with a VAS leg pain score ≤ 17.5 , and 47 (40.5%) with a VAS back pain score ≤ 22.5 .
- Researchers found that lower age (OR 0.94 [95% CI 0.89–0.99] for each year decrease in age) and FABQ Work ≥ 34 (OR 0.16 [95% CI 0.04–0.61]) were independent variables predicting a successful outcome on the ODI.
- Higher education (OR 5.77 [95% CI 1.46–22.87]) and working full-time (OR 2.70 [95% CI 1.02–7.18]) were statistically significant ($P < 0.05$) independent predictors for successful outcome (VAS score ≤ 17.5) on the measure of leg pain.
- Lower age predicted success on ODI (OR 0.94 [95% CI 0.89 to 0.99] for each year) and less back pain (OR 0.94 [95% CI 0.90 to 0.99]).
- Higher education (OR 5.77 [95% CI 1.46 to 22.87]), working full-time (OR 2.70 [95% CI 1.02 to 7.18]) and muscle weakness at baseline (OR 4.11 [95% CI 1.24 to 13.61]) predicted less leg pain, and reflex impairment at baseline predicted the contrary (OR 0.39 [95% CI 0.15 to 0.97]).

DISC

Disc degeneration and motion

Spine (Phila Pa 1976). 2014 Dec 9.

Effect of Disc Degeneration on Lumbar Segmental Mobility analyzed by Kinetic Magnetic Resonance Imaging.

Lao L¹, Daubs MD, Scott TP, Lord EL, Cohen JR, Yin R, Zhong G, Wang JC.
Author information

Abstract

Study Design. Retrospective radiographic study.**Objective.** To define the relationship between the grade of disc degeneration and the motion of the lumbar spine by using kinetic MRI.**Summary of Background Data.** Disc degeneration is common after middle age. Lumbar instability has generally been recognized as a potential risk factor of low back pain. However, correlations between the grade of disc degeneration and the motion of the lumbar spine need more investigation.**Methods.** Kinetic MRI was performed in 162 patients with symptomatic low back pain without prior history of surgery. The lumbar intervertebral discs were graded by spine surgeons according to the degenerative grading system (Grades I to V). Translational motion and angular variation were measured at each segment from L1-L2 through L5-S1. The relationship between the degree of lumbar disc degeneration and extent of lumbar spine mobility was analyzed.**Results.** The translational motion in discs with Grade I through IV increased gradually, but decreased with Grade V. Compared to other less degenerative grades, Grade V discs had significantly decreased total intervertebral translational motion ($P < 0.05$).

The angular variation in discs with Grade I through IV was fairly constant, but decreased with Grade V. Compared to other degenerative grades (I-IV), Grade V discs had significantly decreased total intervertebral translational motion ($P < 0.05$). For less degenerative Grades I and II discs, the L2-L3 and L3-L4 segmental units contributed the majority of total angular mobility of the spine. However, for the severely degenerated segments, Grade V discs, the contributions of the L2-L3 and L3-L4 significantly decreased ($P < 0.01$).**Conclusions.** As disc degeneration developed from the normal to an increasingly severe stage, the motion of lumbar spine progressed from the normal stage to an unstable phase with higher mobility and finally to an ankylosed stage where stability was increased.

PMID:25494318

**INJECTIONS
SURGERY****Fusion or not?**

Spine (Phila Pa 1976). 2014 Dec 9.

Single level Lumbar Fusion for Degenerative Disc Disease is Associated with Worse outcomes compared to Fusion for Spondylolisthesis in a Workers' Compensation Setting.

Anderson JT¹, Haas AR, Percy R, Woods ST, Ahn UM, Ahn NU.
Author information

Abstract

Study Design. Retrospective cohort study

Objective. Compare lumbar fusion outcomes, return to work (RTW) status in particular, between workers' compensation (WC) subjects undergoing single level posterolateral fusion for either spondylolisthesis or degenerative disc disease (DDD) Summary of Background Data. Lumbar fusion for spondylolisthesis tends to yield more consistent outcomes than fusion for DDD and discogenic low back pain. Within the clinically distinct WC population, relatively few studies exist which evaluate lumbar fusion outcomes.

Methods. 869 Ohio WC subjects were identified that underwent single level posterolateral lumbar fusion with or without posterior interbody fusion between 1993-2010 using CPT procedural and ICD-9 diagnostic codes. 269 underwent fusion for spondylolisthesis, and 620 of underwent fusion for DDD

.Subjects were considered returned to work within a reasonable timeline if they made a stable RTW within 2 years of fusion and remained working for greater than 6 months of the following year. To determine predictors of RTW status, we performed a multivariate logistic regression analysis. We measured a number of secondary outcomes.

Results. Fusion for spondylolisthesis was positively associated with RTW status ($p = 0.050$; OR 1.42, CI 1.00-2.00). 36.4% of the spondylolisthesis cohort and 24.4% of the DDD cohort returned to work in a reasonable timeline postoperatively. Other negative predictors included: age >50 at fusion (OR 0.66, CI 0.45-0.95), >2 years between injury and index fusion (OR 0.59, CI 0.41-0.84), permanent disability (OR 0.61, CI 0.43-0.86), legal representation (OR 0.67, CI 0.46-0.97), and psychological comorbidity before fusion (OR 0.30, CI 0.14-0.62). Subjects in the DDD cohort were prescribed opioid analgesics for an average of 294 of additional days postoperatively ($p < 0.001$), which equated to 24,759 additional milligrams of morphine equivalents ($p < 0.001$).

Conclusions. Our study is supportive of the conclusion that DDD is a questionable indication for spinal fusion. Given the generally poor outcomes of this study, future studies should determine if lumbar fusion surgery is an effective treatment modality in similar WC patients.

PMID: 25494321

PELVIC GIRDLE
PELVIC ORGANS
VISCERA
THORACIC SPINE
CERVICAL SPINE

Emotional states and pain and disability

Do psychological states associate with pain and disability in chronic neck pain patients?

Journal of Back and Musculoskeletal Rehabilitation, 03/04/2015 Dimitriadis Z, et al.

Chronic neck pain is one of the most usual neuromusculoskeletal pain conditions which can lead patients to chronic disability. Similarly to other pain conditions, the changed psychological status of these patients is believed to be associated with their pain condition and disability. However, the association between the psychological status of patients with idiopathic neck pain and their pain intensity and disability is minimally explored. This study was aimed at investigating the association between psychological states (anxiety, depression, kinesiophobia, catastrophizing) of patients with chronic idiopathic neck pain and self-reported pain and disability. It can be concluded that anxiety, depression and catastrophizing of patients with chronic neck pain is associated with their self-reported disability, whereas anxiety is also associated with their pain intensity. Anxiety and catastrophizing may be important predicting markers of patients' self-reported disability.

Methods

- Forty five patients with idiopathic chronic neck pain (more than 6 months, at least once a week) participated.
- Their psychological states were assessed by using the Hospital Anxiety and Depression scale, Pain Catastrophizing scale and Tampa Scale for Kinesiophobia.
- Self-reported disability was recorded with the Neck Disability Index.
- Pain intensity was recorded by using a visual analog scale.

Results

- Neck pain intensity was significantly correlated with anxiety ($p < 0.05$).
- Disability was significantly correlated with anxiety, depression and catastrophizing ($p < 0.05$).
- Multiple regression analysis showed that pain-induced disability can be significantly predicted by anxiety and catastrophizing ($p < 0.05$).

Total disc replacement and depression

Spine (Phila Pa 1976). 2014 Dec 9.

The Impact of the Depression and Anxiety on Prognosis of Cervical total Disc Replacement.

Li S¹, Qi M, Yuan W, Chen H.
Author information

Abstract

Study Design. Prospective clinical study**Objectives.** To identify changes in depression and anxiety after cervical total disc replacement among cervical spondylosis patients, and to investigate their effects on the prognosis.**Summary of Background Data.** Previous researches have reported relationships between mood disorders and lumbar surgery. There have been no previous studies on the effects of depressive and anxiety on the cervical total disc replacement outcome at the 2-year postoperative phase.**Methods.** Eighty-five patients with cervical spondylosis who underwent cervical total disc replacement were included. Patients were evaluated preoperatively and at 6 postoperative time points, including 1 week, 1 month, 3 months, 6 months, 1 year, and 2 years. Depression and anxiety were evaluated by the Zung Self-Rating Depression Scale (SDS) and the Zung Self-Rating Anxiety Scale (SAS). Neurological function was evaluated by the Visual Analog Scale (VAS) and the Japan Orthopedic Association (JOA). The quality of life was assessed by a 36-item short-form health survey (SF-36). A Spearman rank correlation analysis was used.**Results.**

All patients had improvements in clinical symptoms and neurological function. Twelve (14.12%) patients had symptoms of depression and 21 (24.71%) patients had symptoms of anxiety. There was a significant difference between the preoperative and the postoperative SAS scores, whereas the SDS scores were not significantly different over time. For all patients, the VAS scores and the SF-36 scores were associated with the postoperative level of depression and anxiety but not age or the JOA score.**Conclusions.** Some patients with cervical spondylosis have preoperative depression and/or anxiety. Cervical total disc replacement may provide some improvements in these psychological symptoms. The presence of depression and/or anxiety may have a negative influence on the patient's prognosis.

PMID: 25494313

Prognostic factors in C spine pain

Man Ther. 2015 Feb 11. pii: S1356-689X(15)00018-1. doi: 10.1016/j.math.2015.02.001.

Identifying prognostic factors predicting outcome in patients with chronic neck pain after multimodal treatment: A retrospective study.

De Pauw R¹, Kregel J², De Blaiser C³, Van Akeleyen J⁴, Logghe T⁵, Danneels L⁶, Cagnie B⁷.
Author information

Abstract

OBJECTIVES:

This study was conducted to identify possible prognostic factors to predict drop-out and favorable outcome in patients following a multimodal treatment program at an outpatient rehabilitation clinic.

METHODS:

A retrospective cohort study was conducted on 437 patients with chronic neck pain involved in an exercise-based rehabilitation program of an outpatient rehabilitation center between January 2008 and November 2011. Prognostic factors were analyzed through a univariate and a multivariate logistic regression analysis.

RESULTS:

Multivariate logistic regression revealed that a higher age (OR=0.960), presence of headache (OR=0.436) or low back pain (OR=0.525), and having low levels of depression (OR=1.044) increase the odds to complete the multimodal treatment program. A high NDI-score (OR=0.945), a high NRS-score for pain in the upper extremities (OR=0.862), a low NRS score for pain in the neck (OR=1.372), and a trauma in the patient's history (OR=0.411) decrease the odds of having a favorable outcome after the given treatment program.

CONCLUSION:

It is important to assess these prognostic factors as they may help therapists to identify patients with a good prognosis or patients at risk. For those at risk, this would allow the treatment approach to be redirected to address their specific needs.

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KEYWORDS:

Logistic regression; Neck pain; Prognosis; Treatment

PMID: 25725590

Pain and stiffness

J Orthop Sports Phys Ther. 2015 Jan 27:1-29.

Comparison of Cervical Spine Stiffness in Individuals With Chronic Nonspecific Neck Pain and an Asymptomatic Comparison Group.

Ingram LA¹, Snodgrass SJ, Rivett DA.
Author information

Abstract

Study Design Clinical measurement, cross-sectional. **Objective** To determine if spinal joint stiffness is different in individuals with non-specific neck pain, and whether stiffness magnitude is associated with pain intensity and disability. **Background** Manual therapists commonly evaluate spinal joint stiffness in patients presenting with non-specific neck pain. However, a relationship between stiffness and neck pain has not yet been demonstrated. **Methods** Spinal stiffness at C7 was objectively measured in participants with chronic non-specific neck pain whose symptomatic spinal level was identified as C7 (n= 12), and age and gender matched asymptomatic controls (n = 12). Stiffness (slope of the linear region of the force-displacement curve) was quantified using a device applying 5 standardized mechanical force cycles to the C7 spinous process while concurrently measuring displacement and resistance to movement. Stiffness was compared between groups using an independent t-test. Spearman's rho and Pearson's r were used to determine the extent stiffness magnitude was associated with pain intensity (visual analogue scale) and level of disability (Neck Disability Index) respectively, in the group with neck pain. **Results** Participants with non-specific neck pain had greater spinal joint stiffness at C7 compared with asymptomatic individuals (mean difference 1.78 N/mm, 95% CI 0.28, 3.27, P = .022). However, stiffness magnitude in the group with neck pain was not associated (P>.05) with pain intensity or level of disability.

Conclusion These preliminary results suggest that cervical spine stiffness may be greater in the presence of non-specific neck pain. However, judgements regarding pain intensity and level of disability should not be inferred from examinations of spinal joint stiffness. J Orthop Sports Phys Ther, Epub 27 Jan 2015. doi:10.2519/jospt.2015.5711.

KEYWORDS: cervical vertebrae; manual therapy; palpation; physical examination
PMID: 25627153

**UPPER C SPINE
WHIPLASH
CRANIUM/TMJ****Sleep apnea**

J Laryngol Otol. 2015 Jan;129(1):68-72. doi: 10.1017/S0022215114003296.

Obstructive sleep apnoea syndrome does not negatively affect oral and dental health.

Acar M¹, Türkcan I², Özdaş T³, Bal C⁴, Cingi C⁵.

Author information

Abstract

OBJECTIVE:

Obstructive sleep apnoea syndrome can lead to unhealthy open-mouth breathing. We investigated the possible relationship between obstructive sleep apnoea syndrome and dental health. We also evaluated other clinical factors that may affect oral health.

METHODS:

We measured sleep using polysomnography and determined the apnoea-hypopnoea index for a total of 291 patients. We also recorded the demographic data, duration of snoring complaints, educational status and income levels for our patient cohort; finally, we calculated the decayed, missing and filled teeth index.

RESULTS:

Forty-one patients presented with primary snoring (control group) and 250 patients (study group) presented with mild, moderate and severe obstructive sleep apnoea syndrome. We found no correlation between obstructive sleep apnoea syndrome severity and the decayed, missing and filled teeth index ($p = 0.057$). We also found no correlation between the apnoea-hypopnoea and decayed, missing and filled teeth indexes. Age and the duration of snoring complaints were positively correlated with the decayed, missing and filled teeth index while educational status and income levels were negatively correlated ($p < 0.001$).

CONCLUSION:

Obstructive sleep apnoea syndrome does not negatively affect oral and dental health.

KEYWORDS:

Dental Caries

PMID: 25656158

HEADACHES

Diagnosis of migraine

Grey zones in the diagnosis of adult migraine without aura based on the international classification of headache disorders-III beta: Exploring the covariates of possible migraine without aura

Pain Research and Management, 02/06/2015 Ozge A, et al.

In this study, authors want to evaluate the diagnostic value of the International Classification of Headache Disorders (ICHD)–III beta–based diagnosis of migraine without aura; to explore the covariates of possible migraine without aura using an analysis of grey zones in this area; and, finally, to make suggestions for the final version of the ICHD–III. In cases that do not fulfill all of the diagnostic criteria although they are largely consistent with the characteristics of migraine in clinical terms, the authors believe that a history of infantile colic; periodic vomiting (but not periodic vomiting syndrome); recurrent abdominal pain; the presence of motion sickness or vertigo, dizziness or osmophobia accompanying the pain; and comorbid atopic disorder are characteristics that should to be discussed and considered as additional diagnostic criteria (covariates) in the preparation of the final version of ICHD–III.

Methods

- A total of 1365 patients (mean [\pm SD] age 38.5 \pm 10.4 years, 82.8% female) diagnosed with migraine without aura according to the criteria of the ICHD–III beta were included in the present tertiary care–based retrospective study.
- Patients meeting all of the criteria of the ICHD–III beta were classified as having full migraine without aura, while those who did not meet one, two or \geq 3 of the diagnostic criteria were classified as zones I, II and III, respectively.
- The diagnostic value of the clinical characteristics and covariates of migraine were determined.

Results

- Full migraine without aura was evident in 25.7% of the migraineurs.
- A higher likelihood of zone I classification was shown for an attack lasting 4 h to 72 h (OR 1.560; P=0.002), with pulsating quality (OR 4.096; P<0.001), concomitant nausea/vomiting (OR 2.300; P<0.001) and photophobia/phonophobia (OR 4.865; P<0.001).
- The first–rank determinants for full migraine without aura were sleep irregularities (OR 1.596; P=0.005) and periodic vomiting (OR 1.464; P=0.026).
- However, even if not mentioned in ICHD–III beta, the authors determined that motion sickness, abdominal pain or infantile colic attacks in childhood, associated dizziness and osmophobia have important diagnostic value.

**VESTIBULAR
CONCUSSIONS****Changes in gait**

Am J Sports Med. 2015 Mar;43(3):625-32. doi: 10.1177/0363546514560994. Epub 2014 Dec 24.

Adolescents demonstrate greater gait balance control deficits after concussion than young adults.

Howell DR¹, Osternig LR¹, Chou LS².

Author information

Abstract

BACKGROUND:

Age has been described as a factor that affects recovery after concussion. The recommended management protocol is to treat adolescents in a more cautious manner than adults. However, few studies have prospectively and longitudinally assessed the way these age groups perform on motor tasks after concussion.

PURPOSE:

To examine dual-task gait balance control deficits after concussion in a group of adolescents and young adults in reference to matched control subjects within 72 hours of injury and throughout 2 months after injury.

STUDY DESIGN:

Cohort study; Level of evidence, 2.

METHODS:

Adolescents and young adults who sustained a concussion and individually matched controls completed a whole-body motion gait analysis while simultaneously performing a cognitive task. Subjects with concussion reported to the laboratory within 72 hours after injury and at the following time points: 1 week, 2 weeks, 1 month, and 2 months after injury. Control subjects completed the same protocol at similar time points. Gait balance control measurements included whole-body center-of-mass (COM) medial-lateral displacement/velocity and anterior velocity.

RESULTS:

A total of 38 subjects with concussion, 19 young adults (mean \pm SD age, 20.3 \pm 2.4 years) and 19 adolescents (mean \pm SD age, 15.1 \pm 1.1 years), and 38 individually matched control subjects were tested. Within 72 hours of injury, adolescents displayed significantly greater COM medial-lateral displacement ($P = .001$) and peak velocity ($P = .001$) relative to their control group, and the young adult concussion group displayed significantly less peak COM anterior velocity than their control group ($P = .01$). Across the 2 months of testing, adolescents with concussion displayed significantly greater total COM medial-lateral displacement than did adolescent controls ($P = .001$), while young adults with concussion did not significantly differ from their matched controls ($P = .07$).

CONCLUSION:

An examination of gait balance control during dual-task walking revealed that after concussion, in reference to matched controls, adolescents demonstrated greater gait balance control deficits than did young adults initially and throughout the 2-month postinjury period, supporting the recommendation of conservative management for adolescents after concussion.

© 2014 The Author(s). KEYWORDS: adolescence; cerebral concussion; development; postural balance PMID:25540297

History awareness

Am J Sports Med. 2015 Mar;43(3):606-13. doi: 10.1177/0363546514562180. Epub 2015 Jan 5.

Agreement between athlete-recalled and clinically documented concussion histories in former collegiate athletes.

Kerr ZY¹, Mihalik JP², Guskiewicz KM³, Rosamond WD⁴, Evenson KR⁴, Marshall SW⁵.
Author information

Abstract

BACKGROUND:

Athlete-recalled and clinically documented concussion histories have been used in research on former athletes, but both have limitations. Comparisons of these 2 types of concussion histories are needed to improve the accuracy of estimates of concussion history for future research and clinical care.

PURPOSE:

To estimate the agreement between athlete-recalled and clinically documented concussion histories during college and to explore reasons for differences.

STUDY:

Cohort study (diagnosis); Level of evidence, 3.

METHODS:

Athlete-recalled concussion histories were provided by a convenience sample of 130 former collegiate athletes using an online questionnaire, and they were individually linked to previously collected clinical data that tracked medically diagnosed concussions at the host institution from 1996 to 2012. The intraclass correlation coefficient (ICC_{2,1}) was used to assess agreement between athlete-recalled and clinically documented concussion histories. Descriptive analyses were performed to assess reasons for disagreement.

RESULTS:

Agreement between athlete-recalled and clinically documented concussion histories was low (ICC_{2,1} = 0.21; 95% confidence interval, 0.05-0.37), but it was higher for women (ICC_{2,1} = 0.65; 95% confidence interval, 0.44-0.79) and for athletes playing more recently (2005-2012; ICC_{2,1} = 0.39; 95% confidence interval, 0.01-0.67). Of the 53 athletes who self-reported college sports-related concussions, 40% believed that they sustained impacts that should have been diagnosed as concussions but were undetected, and 21% admitted nondisclosure of suspected concussions. Common reasons for nondisclosure included the following: did not think injury was serious enough (91%), did not know it was a concussion (73%), and did not want to leave the game/practice (73%).

CONCLUSION:

Given the low agreement between athlete-recalled and clinically documented concussion histories, methodologic research is needed to improve the quality of tools used to assess concussion histories in former athletes.

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KEYWORDS: concurrent validity; concussion; epidemiology; injury; traumatic brain injury
PMID: 25560539

Diagnosis

A new way to diagnose brain damage from concussions, strokes, and dementia

Tufts University News, 12/16/2014

Non-invasive CHS technology provides real-time information; Tufts University grants commercial rights to Illinois-based company. New optical diagnostic technology developed at Tufts University School of Engineering promises new ways to identify and monitor brain damage resulting from traumatic injury, stroke or vascular dementia – in real time and without invasive procedures. Coherent hemodynamics spectroscopy (CHS), developed and published by Tufts Professor of Biomedical Engineering Sergio Fantini, measures blood flow, blood volume, and oxygen consumption in the brain. It uses non-invasive near infrared (NIR) light technology to scan brain tissue, and then applies mathematical algorithms to interpret that information.

**SHOULDER GIRDLE
CLAVICLE
GLENOHUMERAL/SHOULDER**

ROTATOR CUFF**Arthroscopic repair**

Am J Sports Med. 2015 Mar;43(3):588-96. doi: 10.1177/0363546514561004. Epub 2014 Dec 22.

Arthroscopic repair of partial-thickness and small full-thickness rotator cuff tears: tendon quality as a prognostic factor for repair integrity.

Chung SW¹, Kim JY², Yoon JP³, Lyu SH⁴, Rhee SM⁴, Oh SB¹.

BACKGROUND: The healing failure rate is high for partial-thickness or small full-thickness rotator cuff tears.

PURPOSE: To retrospectively evaluate and compare outcomes after arthroscopic repair of high-grade partial-thickness and small full-thickness rotator cuff tears and factors affecting rotator cuff healing.

STUDY DESIGN: *Cohort study; Level of evidence, 3.*

METHODS: Included in the study were 55 consecutive patients (mean age, 57.9 ± 7.2 years) who underwent arthroscopic repair for high-grade partial-thickness (n = 34) and small full-thickness (n = 21) rotator cuff tears. The study patients also underwent magnetic resonance imaging (MRI) preoperatively and computed tomography arthrography (CTA) at least 6 months postoperatively, and their functional outcomes were evaluated preoperatively and at the last follow-up (>24 months). All partial-thickness tears were repaired after being converted to full-thickness tears; thus, the repair process was almost the same as for small full-thickness tears. The tendinosis of the torn tendon was graded from the MRI images using a 4-point scale, and the reliabilities were assessed. The outcomes between high-grade partial-thickness tears that were converted to small full-thickness tears and initially small full-thickness tears were compared, and factors affecting outcomes were evaluated.

RESULTS:

The inter- and intraobserver reliabilities of the tendinosis grade were good (intraclass correlation coefficient, 0.706 and 0.777, respectively). Failure to heal as determined by CTA was observed in 12 patients with a high-grade partial-thickness tear (35.3%; complete failure in 4 and partial failure in 8) and in 3 patients with a small full-thickness tear (14.3%; complete failure in 1 and partial failure in 2). The patients with high-grade partial-thickness rotator cuff tears showed a higher tendinosis grade than did those with small full-thickness tears (P = .014), and the severity of the tendinosis was related to the failure to heal (P = .037). Tears with a higher tendinosis grade showed a 7.64-times higher failure rate (95% CI, 1.43-36.04) than did those with a lower tendinosis grade (P = .013). All functional outcome scores improved after surgery (all P < .001); however, there was no difference between groups.

CONCLUSION:

The high-grade partial-thickness rotator cuff tears showed more severe tendinosis compared with the small full-thickness tears in this study. Contrary to previous impressions that tear size or fatty infiltration is the factor that most influences healing, tendinosis severity assessed by preoperative MRI was the only factor associated with failure to heal, given the numbers available for analysis, in patients with partial-thickness and small full-thickness rotator cuff tears. Surgeons should pay more attention to tendon quality during repair surgery or rehabilitation in smaller rotator cuff tears, especially in high-grade partial-thickness tears with severe tendinosis.

© 2014 The Author(s). **KEYWORDS:** computed tomography arthrography; healing failure; partial-thickness tear; rotator cuff repair; tendinosis PMID: 25535097

ADHESIVE CAPSULITIS
IMPINGEMENT
SURGERY
ELBOW
WRIST AND HAND
CARPAL TUNNEL SYNDROME
HIP

Reoccurrence of hip fracture

Bone. 2015 Feb 12;75C:72-76. doi: 10.1016/j.bone.2015.02.003.

Risk of second hip fracture persists for years after initial trauma.

Sobolev B¹, Sheehan KJ², Kuramoto L³, Guy P⁴.

Author information

Abstract

BACKGROUND:

Secondary prevention often targets women who suffer from higher rates of second hip fracture than men, especially in the early years after first fracture. Yet, the occurrence of second hip fracture by certain times also depends on the death rate, which is higher in men than women. We compared the risk of sustaining second hip fracture by a certain time between women and men remaining alive at that time.

METHODS:

We retrieved 38,383 hospitalization records of patients aged 60years or older, who were discharged alive after admission for hip fracture surgery between 1990 and 2005 in British Columbia, Canada. The outcome variable was the time to a subsequent hip fracture.

RESULTS:

During ten years of follow-up, 2,902 (8%) patients sustained a second hip fracture, and 21,428 (56%) died before sustaining a second hip fracture. The risk of second hip fracture in the surviving post-fracture patients was higher in women than in men: 2% vs 2%, 5% vs 4%, 9% vs 7%, 15% vs 13%, and 35% vs 30% at 1, 2, 3, 5, and 10years after initial trauma, respectively, crude OR=1.25 (95% CI: 1.13-1.39). However, the risk did not differ between women and men after adjustment, OR=1.09 (95% CI: 0.98-1.21).

CONCLUSIONS:

The risk of second hip fracture persists for at least ten years among hip fracture survivors, and therefore secondary prevention should continue beyond an early post-fracture period. Women and men have similar risks of second hip fracture and both should be considered for secondary prevention.

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KEYWORDS:

Ccompeting risks; Conditional probability; Death rate; Hip fracture; Secondary prevention; Time to subsequent hip fracture

PMID:25681701

REPLACEMENTS

OA

IMPINGEMENT

KNEE

KNEE/ACL

Testing surgical results

Knee Surg Sports Traumatol Arthrosc. 2015 Mar 1.

Effect of fixation angle and graft tension in double-bundle anterior cruciate ligament reconstruction on knee biomechanics.

Sasaki Y¹, Chang SS, Fujii M, Araki D, Zhu J, Marshall B, Linde-Rosen M, Smolinski P, Fu FH.
Author information

Abstract

PURPOSE:

To compare the effect of graft fixation angle and tension in double-bundle anterior cruciate ligament (ACL) reconstruction on knee biomechanics.

METHODS:

Fourteen cadaver knees were tested using a robotic system under two loadings: (1) an 89-N anterior tibial load (ATL) at full extension (FE), 15°, 30°, 45°, 60°, and 90°, and (2) combined 7 N m valgus and 5 N m internal tibial torques (simulated pivot-shift test) at FE, 15° and 30°. Four graft fixation angles and tensions were used for the anteromedial (AM) and posterolateral (PL) bundles, respectively: (Recon 1) 30°/20N and FE/20N, (Recon 2) 30°/30N and FE/10N, (Recon 3) 45°/20N and 15°/20N, and (Recon 4) 45°/30N and 15°/10N.

RESULTS:

All fixation protocols closely restored the intact knee kinematics under ATL and simulated pivot-shift loading. For the AM bundle under ATL, the in situ force (ISF) with Recon 3 at the FE was significantly lower than that of the intact knee. For the PL bundle under ATL, the ISF with Recon 3 at the FE, 15° and 30° was significantly higher than that of the intact knee. In PL bundle under simulated pivot-shift loading, the ISF with Recon 1 and Recon 2 at FE was lower and the ISF of the PL bundle with Recon 3 at the 15° was higher than that of the intact knee.

CONCLUSION:

The AM-45°/30N and PL-15°/10N fixation most closely matched intact knee kinematics; however, stabilizing the knee during anterior tibial translation may risk an imbalance of the AM and the PL bundle loading. The results indicate that ACL bundle forces may not be restored even if the clinical assessment shows good results with the Lachman test and pivot-shift test. This may alter the loading on other structures of the knee.

PMID:25726160

Movement disorders in ACL repair**Research article****Altered movement patterns and muscular activity during single and double leg squats in individuals with anterior cruciate ligament injury****Anna Trulsson^{1,2*}, Michael Miller¹, Gert-Åke Hansson³, Christina Gummesson^{4†} and Martin Garwicz^{5†}***BMC Musculoskeletal Disorders* 2015, **16**:28 doi:10.1186/s12891-015-0472-y

Background Individuals with Anterior Cruciate Ligament (ACL) injury often show altered movement patterns, suggested to be partly due to impaired sensorimotor control. Here, we therefore aimed to assess muscular activity during movements often used in ACL-rehabilitation and to characterize associations between deviations in muscular activity and specific altered movement patterns, using and further exploring the previously developed Test for substitution Patterns (TSP).

Methods Sixteen participants (10 women) with unilateral ACL rupture performed Single and Double Leg Squats (SLS; DLS). Altered movement patterns were scored according to TSP, and Surface Electromyography (SEMG) was recorded bilaterally in six hip, thigh and shank muscles. To quantify deviations in muscular activity, SEMG ratios were calculated between homonymous muscles on injured and non-injured sides, and between antagonistic muscles on the same side. Correlations between deviations of injured/non-injured side SEMG ratios and specific altered movement patterns were calculated.

Results

Injured/non-injured ratios were low at transition from knee flexion to extension in quadriceps in SLS, and in quadriceps and hamstrings in DLS. On injured side, the quadriceps/hamstrings ratio prior to the beginning of DLS and end of DLS and SLS, and tibialis/gastrocnemius ratio at end of DLS were lower than on non-injured side. Correlations were found between specific altered movement patterns and deviating muscular activity at transition from knee flexion to extension in SLS, indicating that the more deviating the muscular activity on injured side, the more pronounced the altered movement pattern. “Knee medial to supporting foot” correlated to lower injured/non-injured ratios in gluteus medius ($r_s = -0.73$, $p = 0.001$), “lateral displacement of hip-pelvis-region” to lower injured/non-injured ratios in quadriceps ($r_s = -0.54$, $p = 0.03$) and “displacement of trunk” to higher injured/non-injured ratios in gluteus medius ($r_s = 0.62$, $p = 0.01$).

Conclusions

Deviations in muscular activity between injured and non-injured sides and between antagonistic muscular activity within injured as compared to non-injured sides indicated specific alterations in sensorimotor control of the lower limb in individuals with ACL rupture. Also, correlations between deviating muscular activity and specific altered movement patterns were suggested as indications of altered sensorimotor control. We therefore advocate that quantitative assessments of altered movement patterns should be considered in ACL-rehabilitation.

Keywords: Anterior cruciate ligament; Movement pattern; Muscular activity; Motor skills; Motor control; Single leg squat; Electromyography (EMG); Postural orientation; Assessment; Physiotherapy

Gait adaptations and acl repair.

J Orthop Sports Phys Ther. 2015 Jan 27:1-23.

Sex-Specific Gait Adaptations Prior to and up to 6 Months After ACL Reconstruction.

Di Stasi SL¹, Hartigan EH, Snyder-Mackler L.
Author information

Abstract

Study Design Controlled longitudinal laboratory study.

Objectives Compare sagittal plane gait mechanics of men and women before and up to 6 months after anterior cruciate ligament reconstruction (ACLR). **Background** Aberrant gait patterns are ubiquitous after anterior cruciate ligament (ACL) rupture and persist after ACLR despite skilled physical therapy. Sex influences post-operative function and second ACL injury risk, but its influence on gait adaptations after injury have not been investigated.

Methods Sagittal plane knee and hip joint excursions during midstance and internal knee and hip extension moments at peak knee flexion were collected on 12 women and 27 men using 3-dimensional gait analysis before (Screen) and after pre-operative physical therapy (Pre-sx), and 6 months after ACLR (6mo). Repeated measures analysis of variance models were used to determine whether limb asymmetries changed differently over time in men and women.

Results Significant time x limb x sex interactions were identified for hip and knee excursions and internal knee extension moments ($P \leq .007$). Both sexes demonstrated smaller knee excursions on the involved compared to the uninvolved knee at each time point ($P \leq .007$), but only women demonstrated a decrease in the involved knee excursion from pre-sx to 6mo ($P = .03$). Women also demonstrated smaller hip excursions ($P < .001$) and internal knee extension moments ($P = .005$) on the involved limb compared to the uninvolved limb at 6mo. Men demonstrated smaller hip excursions and knee moments on the involved limb compared to the uninvolved limb (main effects, $P < .001$).

Conclusion The persistence of limb asymmetries in men and women 6 months after ACLR indicates that current rehabilitation efforts are inadequate for some individuals following ACLR. J Orthop Sports Phys Ther, Epub 27 Jan 2015. doi:10.2519/jospt.2015.5062.

KEYWORDS: ACL; gait; physical therapy; sex differences

PMID: 25627155

**MENISCUS
PATELLA****Exercise benefit**

J Orthop Sports Phys Ther. 2015 Jan 27:1-24.

Can We Predict Which Subjects With Patellofemoral Pain Syndrome Are More Likely to Benefit From Exercise Therapy: A Secondary Explorative Analysis of a Randomized Controlled Trial.

Lankhorst NE¹, van Middelkoop M, van Trier YD, van Linschoten R, Koes BW, Verhaar JA, Bierma-Zeinstra SM.

Author information

Abstract

Study Design Secondary explorative analysis of a randomized controlled trial comparing supervised exercise therapy to usual care in patellofemoral pain syndrome (PFPS) patients. **Objective** To explore which patients with PFPS are more likely to benefit from exercise therapy. **Background** PFPS is a common condition in which exercise therapy is effective in reducing pain and improving function. However not all patients benefit from exercise therapy. **Methods** The study explores patients characteristics that might interact with treatment effects of PFPS in 131 patients treated with usual care or exercise therapy. These characteristics are tested for interaction with treatment in a regression analysis. The primary outcome measures in the present study are function and pain on activity at 3-months follow-up. **Results** None of the tested variables had a significant interaction with treatment. A positive trend was seen for females with PFPS; they were more likely to report higher function scores with exercise therapy than with usual care compared to males with PFPS (β :12.1 95%CI:0.23-24.0, p-value:0.05).

A positive trend was seen for patients with a longer duration of complaints(>6 months); they were more likely to report higher function scores and had less pain on activity after exercise therapy than with usual care compared with those with shorter duration of complaints (β :12.3 95%CI:-0.08- 24.7, p-value:0.05; β :-1.74 95%CI:-3.90-0.43, p-value:0.12, respectively). **Conclusion** Two factors, gender and duration of complaints, might have a predictable value for response to exercise therapy at 3-months follow-up. Due to the explorative design of the study, future research has to confirm this tendency. **Level of Evidence** Prognosis, level 2b. J Orthop Sports Phys Ther, Epub 27 Jan 2015. doi:10.2519/jospt.2015.5583.

KEYWORDS: knee; primary care; treatment

PMID: 25627152

Hip abductor strengthening**High Eccentric Hip Abduction Strength Reduces the Risk of Developing Patellofemoral Pain Among Novice Runners Initiating a Self-Structured Running Program: A 1-Year Observational Study**

Authors: Daniel Ramskov, PT, MHSc¹, Christian Barton, PT, PhD³⁻⁶, Rasmus O. Nielsen, PT, MHSc^{1,2}, Sten Rasmussen, MD^{2,7,8}

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2015, **Volume:** 45 **Issue:** 3 **Pages:** 153-161 doi:10.2519/jospt.2015.5091

Study Design Observational prospective cohort study with 1-year follow-up.

Objectives To investigate the relationship between eccentric hip abduction strength and the development of patellofemoral pain (PFP) in novice runners during a self-structured running regime.

Background Recent research indicates that gluteal muscle weakness exists in individuals with PFP. However, current prospective research has been limited to the evaluation of isometric strength, producing inconsistent findings. Considering that hip muscles, including the gluteus maximus and medius, activate eccentrically to control hip and pelvic motion during weight-bearing activities such as running, the potential link between eccentric strength and PFP risk should be evaluated.

Methods Eight hundred thirty-two novice runners were included at baseline, and 629 participants were included in the final analysis. Maximal eccentric hip abduction strength was measured using a handheld dynamometer prior to initiating a self-structured running program. The diagnostic criteria to classify knee pain as PFP were based on a thorough clinical examination. Participants were followed for 12 months and training characteristics were gathered with a global positioning system.

Results Results from the unadjusted generalized linear regression model for cumulative risk at 25 and 50 km indicated differences in cumulative risk of PFP between high strength, normal strength, and low strength ($P < .05$), with higher strength associated with reduced risk.

Conclusion Findings from this study indicate that, among novice runners, a level of peak eccentric hip abduction strength that is higher than normal may reduce the risk of PFP during the first 50 km of a self-structured running program.

Level of Evidence Prognosis, level 4. *J Orthop Sports Phys Ther* 2015;45(3):153–161. Epub 27 Jan 2015. doi:10.2519/jospt.2015.5091

Keyword: anterior knee pain, chondromalacia, patella

KNEE/TOTAL**Strength testing**

J Rehabil Med. 2015 Feb 12. doi: 10.2340/16501977-1940.

Functional performance is associated with both knee extensor and flexor muscle strength in patients scheduled for total knee arthroplasty: A cross-sectional study.

Skoffler B¹, Dalgas U, Mechlenburg I, Søballe K, Maribo T.
Author information

Abstract

Objective: To determine whether muscle strength in patients scheduled for total knee arthroplasty is: (i) strongly associated with both measured functional performance and patient-reported measures; (ii) more closely associated with functional performance when measured during concentric than during isometric contractions; and (iii) more strongly related to the 30-s chair stand test than to the timed-up-and-go and walking measures. **Design:** Cross-sectional-study. **Patients:** Fifty-nine patients (36 women, 23 men), mean age 70.4 years. **Methods:** Associations between muscle strength, measured functional performance, and patient-reported measures were calculated. **Results:** Both knee extensor and knee flexor strength were associated with performance-based measures. In general, concentric knee flexor muscle strength was more strongly associated with functional performance than was isometric knee flexor strength. Concentric and isometric knee extensor strength were of equal importance.

The 30-s chair stand test was better than the timed-up-and-go and the walking tests at determining muscle strength. **Conclusion:** Future rehabilitation programmes should include both the knee extensor muscles and the knee flexor muscles in order to improve functional performance. The 30-s chair stand test is a valid and clinical relevant proxy measure of knee extensor and knee flexor muscle strength.

PMID: 25678417

KNEE/EXERCISE
OSTEOARTHRITIS/KNEE
FOOT AND ANKLE

Ankle ROM

Scand J Med Sci Sports. 2015 Feb 12. doi: 10.1111/sms.12406.

Effects of hip and head position on ankle range of motion, ankle passive torque, and passive gastrocnemius tension.

Andrade RJ¹, Lacourpaille L, Freitas SR, McNair PJ, Nordez A.

Author information

Abstract

Ankle joint range of motion (ROM) is notably influenced by the position of the hip joint. However, this result remains unexplained. Thus, the aim of this study was to test if the ankle passive torque and gastrocnemius muscle tension are affected by the hip and the head positions. The torque and the muscle shear elastic modulus (measured by elastography to estimate muscle tension) were collected in nine participants during passive ankle dorsiflexions performed in four conditions (by combining hip flexion at 90 or 150°, and head flexed or neutral). Ankle maximum dorsiflexion angle significantly decreased by flexing the hip from 150 to 90° ($P < 0.001$; mean difference $17.7 \pm 2.5^\circ$), but no effect of the head position was observed ($P > 0.05$). Maximal passive torque and shear elastic modulus were higher with the hip flexed at 90° ($P < 0.001$). During submaximal ROM, no effects of the head and hip positioning ($P > 0.05$) were found for both torque and shear elastic modulus at a given common ankle angle among conditions.

Shifts in maximal ankle angle due to hip angle manipulation are not related neither to changes in passive torque nor tension of the gastrocnemius. Further studies should be addressed to better understand the functional role of peripheral nerves and fasciae in the ankle ROM limits.

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KEYWORDS: Stretching; elastography; fascia; flexibility; muscle; neurodynamics; range of motion; sciatic nerve; supersonic shear imaging

PMID: 25676048

ORTHOTICS**Impact of orthotics in ice skaters stability**

J Sport Rehabil. 2015 Feb 24.

Effect of Custom Foot Insoles on Postural Stability in Figure Skaters While on Ice.

Grewal GS¹, Baisch R, Lee-Eng J, Wu S, Jarrett B, Humble N, Najafi B.

Author information

Abstract

CONTEXT:

Improvements in postural stability among figure skaters can play a significant role in performance as well as reducing fall-risk.

OBJECTIVE:

The aim of this pilot study was to explore the effect of custom foot insoles on postural stability among advanced figure skaters.

DESIGN:

Exploratory Study.

SETTING:

Out of Laboratory.

PARTICIPANTS:

Nine advanced figure skaters were recruited and 7 completed the study (Age: 38±18.5, BMI: 25±3.6 Kg/m²).

INTERVENTION:

Custom foot insoles.

MAIN OUTCOME MEASURES:

Primary outcome of changes in postural stability (PS) quantified by center of mass sway with secondary outcomes of ankle and hip joint sway and joint range of motion. Sway measurements were assessed using body-worn sensors while participants wore skates on ice. Postural stability was assessed in single stance as well as during gliding on dominant foot.

RESULTS:

A significant improvement in static PS was observed after 6 week use of custom insoles. The center of mass sway reduced significantly on average by 48.44% (p=0.023) and ankle joint sway reduced by 45.7% (p=0.05) during single stance balance measurements. During gliding maneuver non-significant changes were observed for both ankle and knee joint range of motion.

CONCLUSION:

The results of this study suggest proof of concept toward benefits of custom insoles in improving postural stability among advanced figure skaters. In order to generalize the findings randomized controlled trials with larger sample sizes are warranted.

PMID:25710078

ANKLE/INSTABILITY ACHILLES TENDON

Tendinosis

Clin Orthop Surg. 2015 Mar;7(1):1-7. Epub 2015 Feb 10.

Achilles Tendinosis: Treatment Options.

Lopez RG¹, Jung HG¹.
Author information

Abstract

Athletes usually complain of an ongoing or chronic pain over the Achilles tendon, but recently even non-athletes are experiencing the same kind of pain which affects their daily activities. Achilles tendinosis refers to a degenerative process of the tendon without histologic or clinical signs of intratendinous inflammation. Treatment is based on whether to stimulate or prevent neovascularization. Thus, until now, there is no consensus as to the best treatment for this condition. This paper aims to review the common ways of treating this condition from the conservative to the surgical options.

KEYWORDS: Achilles tendon; Pain management; Surgical procedures; Tendinopathy
PMID:25729512

**PLANTAR SURFACE
HALLUX VALGUS
RHUMATOID ARTHRITIS
MANUAL THERAPY**

PA mobs in LBP

Effects of unilateral posteroanterior mobilization in subjects with sacralized lumbosacral transitional vertebrae

Journal of Bodywork & Movement Therapies , 03/06/2015 Angmo P, et al.

In this study, authors want to find out the efficacy of unilateral posteroanterior (PA) mobilization over type IA and type IIA sacralized lumbosacral transitional vertebrae in patients with low back pain with or without leg pain. The results of the study suggest that unilateral PA pressure is an effective mobilization method in reducing low back pain, improving ROM and related disability as compared to impairment based exercises alone in patients with low back pain with or without radiation to lower limbs having abnormally large transverse processes and hypomobile type IA and II A lumbo–sacral transitional vertebrae.

-Experimental randomized control study.

-30 subjects, Sampling: simple random sampling.

-GROUP A– 15 subjects – self lumbar mobility and stretching exercises + Unilateral PA mobilization + hot pack.

-GROUP B– 15 subjects – self lumbar mobility and stretching exercises + hot pack.

-Before initiating treatment, subjects were assessed for dependent variables: Pain intensity by - VAS, Forward bending and side bending ROM by modified finger to floor method with the help of an inch–tape and functions by Modified Oswestry Functional Disability Questionnaires.

-Post test measurements were taken after completion 2 weeks of therapy

Upper cervical manipulation and blood flow**The immediate effect of atlanto-axial high velocity thrust techniques on blood flow in the vertebral artery: A randomized controlled trial**

Manual Therapy , 03/04/2015 Erhardt J, et al.

Background

High velocity thrust (HVT) cervical techniques have been associated with serious vertebral artery (VA) trauma. Despite numerous studies, the nature of this association is uncertain. Previous studies have failed to demonstrate haemodynamic effects on the VA in simulated pre-thrust positions. No study has investigated haemodynamic effects during or immediately following HVT, nor sufficiently controlled for the influence of the thrust.

Objectives

To investigate the immediate effects of HVT of the atlanto-axial joint upon haemodynamics in the sub-occipital portion of the vertebral artery (VA3).

Design

Randomized Controlled Trial.

Method

Twenty-three healthy participants (14 women, 9 men; mean age 40, range 27-69 years of age) were randomly assigned to two groups: an intervention group (MANIP, n=11) received HVT to the atlanto-axial segment whilst a control group (CG, n=12) was held in the pre-manipulative hold position. Colour-flow Doppler ultrasound was used to measure VA3 hemodynamics. Primary outcome measures were peak systolic (PSV) and end diastolic velocities (EDV) of three cardiac cycles measured at neutral (N1), pre-HVT (PreMH), post-HVT (PostMH), post-HVT-neutral (N2) positions.

Results

Test-retest reliability for the Doppler measures demonstrated intra-class correlation coefficient (ICC) of 0.99 (95% CI 0.98-1.0) for PSV and 0.91 (95% CI 0.84-0.96) for EDV. Visually, EDV were lower in the MANIP group than in the CONTROL group across the four measurements. However, there were no significantly different changes (at $p < 0.01$) between the MANIP and CONTROL groups for any measurement variable.

Conclusions

HVT to the atlanto-axial joint segment does not affect the haemodynamics of the sub-occipital portion of the vertebral artery during or immediately following HVT in healthy subjects.

Manipulation and stroke

J Manipulative Physiol Ther. 2015 Feb;38(2):93-101. doi: 10.1016/j.jmpt.2014.12.001. Epub 2015 Jan 14.

Risk of stroke after chiropractic spinal manipulation in medicare B beneficiaries aged 66 to 99 years with neck pain.

Whedon JM¹, Song Y², Mackenzie TA³, Phillips RB⁴, Lukovits TG⁵, Lurie JD³.
Author information

Abstract

OBJECTIVE:

The purpose of this study was to quantify risk of stroke after chiropractic spinal manipulation, as compared to evaluation by a primary care physician, for Medicare beneficiaries aged 66 to 99 years with neck pain.

METHODS:

This is a retrospective cohort analysis of a 100% sample of annualized Medicare claims data on 1 157 475 beneficiaries aged 66 to 99 years with an office visit to either a chiropractor or primary care physician for neck pain. We compared hazard of vertebrobasilar stroke and any stroke at 7 and 30 days after office visit using a Cox proportional hazards model. We used direct adjusted survival curves to estimate cumulative probability of stroke up to 30 days for the 2 cohorts.

RESULTS:

The proportion of subjects with stroke of any type in the chiropractic cohort was 1.2 per 1000 at 7 days and 5.1 per 1000 at 30 days. In the primary care cohort, the proportion of subjects with stroke of any type was 1.4 per 1000 at 7 days and 2.8 per 1000 at 30 days. In the chiropractic cohort, the adjusted risk of stroke was significantly lower at 7 days as compared to the primary care cohort (hazard ratio, 0.39; 95% confidence interval, 0.33-0.45), but at 30 days, a slight elevation in risk was observed for the chiropractic cohort (hazard ratio, 1.10; 95% confidence interval, 1.01-1.19).

CONCLUSIONS:

Among Medicare B beneficiaries aged 66 to 99 years with neck pain, incidence of vertebrobasilar stroke was extremely low. Small differences in risk between patients who saw a chiropractor and those who saw a primary care physician are probably not clinically significant.

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KEYWORDS:

Chiropractic; Medicare; Neck Pain; Spinal Manipulation, Adverse Effects; Stroke; Vertebral Artery Dissection

PMID:25596875

**NEUROMOBILIZATION
STRETCHING/MUSCLES
STM****LBP and acupuncture**

Eur J Pain. 2015 Feb 17. doi: 10.1002/ejp.671.

Local and distant acupuncture points stimulation for chronic musculoskeletal pain: A systematic review on the comparative effects.

Wong Lit Wan D¹, Wang Y, Xue CC, Wang LP, Liang FR, Zheng Z.
Author information

Abstract

One in four people suffers from chronic musculoskeletal pain (CMP). Acupuncture points stimulation is increasingly used for pain relief for CMP. Commonly, a combination of local and distant points is used. However, the difference between the effects of local and distant point stimulation is unknown. This systematic review aimed to determine if there was a difference in effects between stimulating local and distant points, and the combination of both when compared with either alone. English and Chinese electronic databases were searched to identify randomized controlled trials, where local or distant points were stimulated in adults with CMP. Pain intensity was the primary outcome measure. Nineteen were included in the qualitative analysis and 15 in the meta-analysis. Local and distant point stimulation was more effective than their respective controls in pain reduction immediately after treatment. Three studies directly compared the stimulation of local and distant points and found no significant difference between the two. No studies compared combined local and distant point stimulation with either alone. Subgroup analyses showed that, local tender point stimulation was more effective than local acupuncture points.

Local and distant point stimulation induces similar degree of acupuncture analgesia. The benefit of combining local and distant point stimulation is unknown. However, subgroup analyses suggested that local tender points could be important in the treatment of CMP for short-term pain relief.

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PMID:25690699

MUSCLES
STRETCHING
MOTOR CONTROL
CFS/BET
EXERCISE

Prone extension exercises and thoracic muscles

Selective recruitment of the thoracic erector spinae during prone trunk-extension exercise

Journal of Back and Musculoskeletal Rehabilitation, 03/04/2015 Park KH, et al.

This study examined the effect of modified prone trunk–extension (PTE) exercises on selective activity of the thoracic erector spinae. The findings suggest that PTE exercise with the XP aligned with the table edge increased the selective activation of the thoracic erector spinae muscles.

Methods

- Thirty–nine healthy subjects performed four modified PTE exercises, involving location of the edge of the table (iliac crests [IC] vs. xiphoid process [XP]) and the degree of trunk extension (horizontal vs. hyperextension).
- Electromyography signals were collected bilaterally from the longissimus thoracis (LT), iliocostalis thoracis (ICT), and iliocostalis lumborum (ICL).
- Normalized LT:ICL and ICT:ICL ratios were calculated.
- The data were analyzed using a repeated measures two–way analysis of variance.

Results

- The LT:ICL and ICT:ICL ratios were significantly higher under the XP than the IC condition ($p < 0.05$); however, the degree of trunk extension did not affect the ratio ($p > 0.05$).
- Activity in the lumbar erector spinae and left ICT muscles was greater when subjects were in the hyperextended position than in the horizontal position.
- Moreover, activity in the thoracic erector spinae was greater when the table edge was aligned with the IC compared with the XP ($p < 0.05$).

Selective vs general exercise

A tailored exercise program versus general exercise for a subgroup of patients with low back pain and movement control impairment: a randomised controlled trial with one-year follow-up

Manual Therapy , 03/06/2015 Saner J, et al.

The effectiveness of a specific exercise treatment to improve movement control was tested in this study. This study found no additional benefit of specific exercises targeting MCI.

Methods

- Using a multicentre randomised controlled trial (RCT), the authors compared exercises that targeted MCI (MC) with a general exercise (GE) treatment.
- After randomisation, patients in both groups (n(MC)=52; n(GE)=54) were treated in eight private physiotherapy practices and five hospital outpatient physiotherapy centres.
- Follow-up measurements were taken at post-treatment, six months and 12 months.
- The primary outcome measurement was the Patient Specific Function Scale (PSFS).

Results

- PSFS showed no difference between groups after treatment, or at six months and 12 months.
- Secondary outcome analysis for pain and disability, measured with the Graded Chronic Pain scale and the Roland Morris Disability Questionnaire respectively, showed that a small improvement post-treatment levelled off over the long term.
- Both groups improved significantly ($p < 0.001$) over the course of one year

Hip exercises in LBP**Effectiveness of targeted home-based hip exercises in individuals with non-specific chronic or recurrent low back pain with reduced hip mobility: A randomised trial**

Journal of Back and Musculoskeletal Rehabilitation, 03/04/2015

Winter S

The relationship between low back pain (LBP) and reduced hip rotation has been well established. However, there is lack of studies investigating the effect of treatment targeted at the hip in people with LBP. The aim of this study was to assess the level of effectiveness that different types of exercises targeted at the hip had on pain and function in individuals with non-specific chronic or recurrent LBP with concurrent reduced hip rotation. In individuals with non-specific LBP and reduced hip rotation, clinical intervention of providing exercises targeted at the hip can be beneficial in improving pain and function, with strengthening exercises most beneficial for improving function.

Methods

- Thirty participants were assigned to one of three exercise groups: hip rotation stretching, multi-directional hip stretching and hip strengthening.
- All groups participated in a six week home exercise program.
- Pain (numerical rating scale), functional disability (Modified Oswestry Disability Questionnaire; MOD), and hip rotation measurements were assessed at baseline and post intervention.

Results

- Results revealed that all exercise groups were effective in improving pain and function (MOD) ($P < 0.05$).
- Between group comparisons revealed that hip strengthening was more effective than hip rotation exercises in improving functional disability ($P = 0.03$).
- The majority of participants in all groups (60–70%) demonstrated clinical improvements in pain, but only the hip strengthening group had the majority of participants (80%) exhibit clinical improvements in function.

LBP exercise

Clin Rehabil. 2015 Feb 13. pii: 0269215515570379.

Exercise interventions for the treatment of chronic low back pain: A systematic review and meta-analysis of randomised controlled trials.

Searle A¹, Spink M², Ho A³, Chuter V⁴.

Author information

Abstract

OBJECTIVE:

To determine, for adults with chronic low back pain, which exercise interventions are the most effective at reducing pain compared to other treatments.

DATA SOURCES:

A search of MEDLINE, CINAHL, EMBASE, SPORTDiscus, PsycINFO and The Cochrane Library was conducted up to October 2014.

REVIEW METHODS:

Databases were searched for published reports of randomised trials that investigated the treatment of chronic low back pain of non-specific origin with an exercise intervention. Two authors independently reviewed and selected relevant trials. Methodological quality was evaluated using the Downs and Black tool.

RESULTS:

Forty-five trials met the inclusion criteria and thirty-nine were included in the meta-analysis. Combined meta-analysis revealed significantly lower chronic low back pain with intervention groups using exercise compared to a control group or other treatment group (Standard Mean Deviation (SMD) = -0.32, CI 95% -0.44 to -0.19, P < 0.01). Separate exploratory subgroup analysis showed a significant effect for strength/resistance and coordination/stabilisation programs.

CONCLUSIONS:

Our results found a beneficial effect for strength/resistance and coordination/stabilisation exercise programs over other interventions in the treatment of chronic low back pain and that cardiorespiratory and combined exercise programs are ineffective.

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KEYWORDS:

Chronic low back pain; exercise; meta-analysis; systematic review

PMID: 25681408

Serratus anterior and push-ups**Research article****The effects of exercise type and elbow angle on vertical ground reaction force and muscle activity during a push-up plus exercise**

Jun G San Juan^{1*}, **David N Suprak^{1†}**, **Sean M Roach^{2†}** and **Marc Lyda^{2†}**
BMC Musculoskeletal Disorders 2015, **16**:23 doi:10.1186/s12891-015-0486-5

Abstract

Background

Proper alignment of the scapula during upper extremity motion is important in maintaining shoulder joint function and health. Push-up plus exercise is considered as one of the best exercise to strengthen the muscles that stabilize the scapula. The purpose of the study is to examine the effects of push-up plus variants and elbow position on vertical ground reaction force and electromyographical activity of four shoulder muscles during concentric contraction.

Methods

A total of 22 healthy subjects volunteered for the study. Each of the subjects performed both modified and traditional push-up plus. Modified push-up plus was performed with both knees and hands touching the ground while the traditional push-up plus was executed with hands and feet contacting the ground. Electromyography (EMG) of the upper trapezius (UT), lower trapezius (LT), infraspinatus (INFRA), and serratus anterior (SA), and vertical ground reaction forces (vGRF) were collected.

Results

The traditional push-up plus exhibited higher EMG activity in all muscles tested ($P < .05$) and vertical ground reaction force ($P < .001$) compared to modified push-up plus. The highest difference in EMG activity between the two exercises was observed with the Serratus Anterior muscle (22%). Additionally, the traditional push-up plus presented a higher vGRF compared to the modified push-up plus ($P < .001$) by 17%. The SA had the greatest EMG activity compared to the other muscles tested during the concentric phase of the traditional push-up plus, and this did not occur during the plus phase of the exercise.

Conclusion

The highest activity of the serratus anterior occurred at 55° of elbow extension during the concentric phase of the traditional PUP and not at the plus phase of the exercise. This suggests that when prescribing an exercise to target the serratus anterior, a traditional push-up is adequate and the plus-phase is not necessary. However, for patients that cannot perform a traditional push-up, the modified push-up plus would be a great alternative to strengthen their serratus anterior.

CORE

LBP and core

Efficacy of core muscle strengthening exercise in chronic low back pain patients

Journal of Back and Musculoskeletal Rehabilitation, 12/24/2014 Kumar T, et al.

This study evaluated the effect of core muscle strengthening intervention on chronicity of chronic low back pain. This study concludes that core muscle strengthening exercise along with lumbar flexibility and gluteus maximus strengthening is an effective rehabilitation technique for all chronic low back pain patients irrespective of different duration (less than one year and more than one year) of their pain.

Methods

- Thirty patients were recruited from the outpatient department of the National Institute for the Orthopedically Handicapped.
- These 30 patients were divided into two groups: A and B on the basis of duration of low back pain.
- Group–A patients complain about pain duration for more than twelve months and Group B complains about pain duration from three to twelve months.
- Both the groups were received same intervention for six weeks.
- Assessment was done pre intervention and post intervention after six weeks for both the groups.
- For both the groups the assessment was done after six weeks for pre and post intervention.

Results

- The result described both the groups showed improvement in all the outcome measures including pain as well as in function using Numerical pain rating scale, Oswestry Disability Index, Sorensen test, Gluteus Maximus Strength, Activation of transversus abdominis and Modified–Modified Schober's Test.
- The improvement was statistically non–significant with inter groups and significant within group.

POSTURE**Forward head posture and LBP**

J Manipulative Physiol Ther. 2015 Feb 19. pii: S0161-4754(14)00276-0. doi: 10.1016/j.jmpt.2014.11.009.

The Effect of Adding Forward Head Posture Corrective Exercises in the Management of Lumbosacral Radiculopathy: A Randomized Controlled Study.

Moustafa IM¹, Diab AA².
Author information

Abstract

OBJECTIVE:

The purpose of this study was to determine the immediate and long-term effects of a multimodal program, with the addition of forward head posture correction, in patients with chronic discogenic lumbosacral radiculopathy.

METHODS:

This randomized clinical study included 154 adult patients (54 females) who experienced chronic discogenic lumbosacral radiculopathy and had forward head posture. One group received a functional restoration program, and the experimental group received forward head posture corrective exercises. Primary outcomes were the Oswestry Disability Index (ODI). Secondary outcomes included the anterior head translation, lumbar lordosis, thoracic kyphosis, trunk inclination, lateral deviation, trunk imbalance, surface rotation, pelvic inclination, leg and back pain scores, and H-reflex latency and amplitude. Patients were assessed at 3 intervals (pretreatment, 10-week posttreatment, and 2-year follow-up).

RESULTS:

A general linear model with repeated measures indicated a significant group × time effect in favor of the experimental group on the measures of ODI ($F = 89.7$; $P < .0005$), anterior head translation ($F = 23.6$; $P < .0005$), H-reflex amplitude ($F = 151.4$; $P < .0005$), H-reflex latency ($F = 99.2$; $P < .0005$), back pain ($F = 140.8$; $P < .0005$), and leg pain ($F = 72$; $P < .0005$). After 10 weeks, the results revealed an insignificant difference between the groups for ODI ($P = .08$), back pain ($P = .29$), leg pain ($P = .019$), H-reflex amplitude ($P = .09$), and H-reflex latency ($P = .098$). At the 2-year follow-up, there were significant differences between the groups for all variables adopted for this study ($P < .05$).

CONCLUSIONS:

The addition of forward head posture correction to a functional restoration program seemed to positively affect disability, 3-dimensional spinal posture parameters, back and leg pain, and S1 nerve root function of patients with chronic discogenic lumbosacral radiculopathy.

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KEYWORDS: Head; Low Back Pain; Posture; Radiculopathy; Randomized Controlled Trial
PMID: 25704221

Williams method

Effects of an 8-week corrective program (William-based) on lumbar angle and flexibility of lumbosacral muscles in females aged 15 to 18 years old

Journal of Back and Musculoskeletal Rehabilitation, 03/04/2015 Javid M, et al.

There are many types of treatments and recommendations for restoring back deformities depending on doctors' knowledge and opinions. The purpose of the exercises is to reduce pain and to ensure stability of the lower trunk by toning the abdominal muscles, buttocks and hamstrings. Given the duration of flares and relapses rate, it is important to apply an efficient and lasting treatment. To evaluate the effects of 8 weeks of William's training on flexibility of lumbosacral muscles and lumbar angle in females with Hyperlordosis. The findings show that William's corrective training can be considered as a useful and valid method for restoring and refining back deformities like as accentuated back-arc and became weakened muscles' performance in lumbar areas.

Methods

- Forty female students with lumbar lordosis more than normal degrees (Hyperlordotic) that randomly divided into exercise and control groups were selected as the study sample.
- The lumbar lordosis was measured using a flexible ruler, flexibility of hamstring muscles was measured with the active knee extension test, the hip flexor muscles was measured using Thomas test, the lumbar muscles flexibility measures by Schober test, abdominal muscles strength measured by Sit-Up test and back pain was measured using McGill's Visual Analogue Scales (VAS) questionnaire.
- Data were compared before and post-test using independent and paired t-testes.

Results

- Results showed that 8 weeks of William's exercise led to significant increase in lumbar angle, flexibility of hamstring muscles, hip flexor muscles flexibility, lumbar extensor muscles flexibility, abdominal muscles strength and back pain.

Postural measurements

J Manipulative Physiol Ther. 2015 Feb 19. pii: S0161-4754(15)00002-0. doi: 10.1016/j.jmpt.2015.01.001.

Comparison of Parameters Characterizing Lumbar Lordosis in Radiograph and Photogrammetric Examination of Adults.

Drzał-Grabiec J¹, Truszczyńska A², Tarnowski A³, Płaszewski M⁴.

Author information

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³Professor, Psychology Faculty, Warsaw University, Warsaw, Poland.

⁴Assistant Professor, Physical Education and Sport Faculty, Jozef Pilsudski University of Physical Education, Biała Podlaska, Poland.

Abstract

OBJECTIVE:

The purpose of this study was to test validity of photogrammetry compared with radiography as a method of measuring the Cobb angle and the size of anterior-posterior spine curvatures in adults.

METHODS:

The study included 50 volunteers, 23 men and 27 women whose mean age was 52.6 years. The average weight of the subjects was 81.3 kg, average body height was 172.0 cm, and the average body mass index was 27.4. Based on radiologic examination, the length and depth of lumbar lordosis were determined and the size of the Cobb angle of lumbar scoliosis. After the radiologic examination, a photogrammetric test was performed for each subject with the projection moire phenomenon.

RESULTS:

The Pearson correlation found statistically significant associations concerning the length of lordosis ($P < .001$) and the Cobb angle ($P < .001$). Correlation of the depth of lordosis indicated a strong trend ($P = .063$).

CONCLUSIONS:

This study found that the moire method of photogrammetric measurement produced similar findings to radiographic measurements in determining size of the Cobb angle and the length of lumbar lordosis.

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KEYWORDS: Lumbar Vertebrae; Photogrammetry; Radiography; Spine

PMID: 25704220

SCOLIOSIS**Exercise**

Scoliosis. 2015 Feb 5;10:3. doi: 10.1186/s13013-014-0027-2. eCollection 2015.

SEAS (Scientific Exercises Approach to Scoliosis): a modern and effective evidence based approach to physiotherapeutic specific scoliosis exercises.

Romano M¹, Negrini A¹, Parzini S¹, Tavernaro M¹, Zaina F¹, Donzelli S¹, Negrini S².
Author information

Abstract**BACKGROUND:**

SEAS is the acronym for "Scientific Exercise Approach to Scoliosis", a name related to the continuous changes of the approach based on results published in the literature.

REHABILITATION PROGRAM:

SEAS is an individualized exercise program adapted to all situations of conservative treatment of scoliosis: stand-alone in low-medium degree curves during growth to reduce the risk of bracing; complimentary to bracing in medium-high degree curves during growth, with the aim to increase correction, prepare weaning, and avoid/reduce side-effects; for adults either progressing or fused, to help stabilising the curve and reduce disability. SEAS is based on a specific active self-correction technique performed without external aid, and incorporated in functional exercises. Evaluation tests guide the choice of the exercises most appropriate to the individual patient. Improvement of the stability of the spine in active self-correction is the primary objective of SEAS. SEAS exercises train neuromotor function so to stimulate by reflex a self-corrected posture during the activities of daily life. SEAS can be performed as an outpatient (two/three times a week 45 for minutes) or as a home program to be performed 20 minutes daily. In the last case, expert physiotherapy sessions of 1.5 hours every three months are proposed.

RESULTS:

Different papers, including a randomized controlled trial (2014), published over the past several years, documented the efficacy of the SEAS approach applied in the various phases of scoliosis treatment in reducing Cobb angle progression and the need to wear a brace.

CONCLUSIONS:

SEAS is an approach to scoliosis exercise treatment with a strong modern neurophysiological basis, to reduce requirements for patients and possibly the costs for families linked to the frequency and intensity of treatment and evaluations. Therefore, SEAS allows treating a large number of patients coming from far away. Even if SEAS appears simple by requiring less physiotherapist supervision and by using fewer home exercises prescribed at a lower dose than some of the other scoliosis-specific exercise approaches, real expertise in scoliosis, exercises, and patient and family management is required. The program has no copyrights, and teachers are being trained all over the world.

PMID: 25729406

ATHLETICS GAIT RUNNING

Barefoot running patterns

Plantar loading and foot-strike pattern changes with speed during barefoot running in those with a natural rearfoot strike pattern while shod

The Foot, 03/06/2015 Cooper DM, et al.

Abstract

Background

Claims of injury reduction related to barefoot running has resulted in interest from the running public, however, its risks are not well understood for those who typically wear cushioned footwear.

Objectives

Examine how plantar loading changes during barefoot running in a group of runners that ordinarily wear cushioned footwear and demonstrate a rearfoot strike pattern (RFSP) without cueing or feedback alter their foot strike pattern and plantar loading when asked to run barefoot at different speeds down a runway.

Method

Forty-one subjects ran barefoot at three different speeds across a pedography platform which collected plantar loading variables for 10 regions of the foot; data were analyzed using two-way mixed Multivariate Analysis of Variance (MANOVA).

Results

A significant foot strike position (FSP)*speed interaction in each of the foot regions indicated that plantar loading differed based on FSP across the different speeds. The RFSP provided the highest total forces across the foot while the pressures displayed in subjects with a non-rearfoot strike pattern (NRFSP) was more similar between each of the metatarsals.

Conclusions

The majority of subjects ran barefoot with a NRFSP and demonstrated lower total forces and more uniform force distribution across the metatarsal regions. This may have an influence in injuries sustained in barefoot running.

Keywords: plantar loading, speed, foot-strike, barefoot, running.

PAIN

Neuroplasticity and chronic pain

Is neuroplasticity in the central nervous system the missing link to our understanding of chronic musculoskeletal disorders?René Pelletier^{1*}, Johanne Higgins¹² and Daniel Bourbonnais¹²*BMC Musculoskeletal Disorders* 2015, **16**:25 doi:10.1186/s12891-015-0480-y

Abstract

Background

Musculoskeletal rehabilitative care and research have traditionally been guided by a structural pathology paradigm and directed their resources towards the structural, functional, and biological abnormalities located locally within the musculoskeletal system to understand and treat Musculoskeletal Disorders (MSD). However the structural pathology model does not adequately explain many of the clinical and experimental findings in subjects with chronic MSD and, more importantly, treatment guided by this paradigm fails to effectively treat many of these conditions.

Discussion

Increasing evidence reveals structural and functional changes within the Central Nervous System (CNS) of people with chronic MSD that appear to play a prominent role in the pathophysiology of these disorders. These neuroplastic changes are reflective of adaptive neurophysiological processes occurring as the result of altered afferent stimuli including nociceptive and neuropathic transmission to spinal, subcortical and cortical areas with MSD that are initially beneficial but may persist in a chronic state, may be part and parcel in the pathophysiology of the condition and the development and maintenance of chronic signs and symptoms. Neuroplastic changes within different areas of the CNS may help to explain the transition from acute to chronic conditions, sensory-motor findings, perceptual disturbances, why some individuals continue to experience pain when no structural cause can be discerned, and why some fail to respond to conservative interventions in subjects with chronic MSD. We argue that a change in paradigm is necessary that integrates CNS changes associated with chronic MSD and that these findings are highly relevant for the design and implementation of rehabilitative interventions for this population.

Summary

Recent findings suggest that a change in model and approach is required in the rehabilitation of chronic MSD that integrate the findings of neuroplastic changes across the CNS and are targeted by rehabilitative interventions. Effects of current interventions may be mediated through peripheral and central changes but may not specifically address all underlying neuroplastic changes in the CNS potentially associated with chronic MSD. Novel approaches to address these neuroplastic changes show promise and require further investigation to improve efficacy of current approaches.

Keywords:

Musculoskeletal disorders; Chronic low back pain; Osteoarthritis; Neuroplasticity; Periaqueductal grey; Rostral ventromedial medulla; Rehabilitation; Primary somatosensory cortex; Primary motor cortex; Limbic; Pre-frontal; Pain

Sleep and depression

Depress Anxiety. 2015 Feb 18. doi: 10.1002/da.22355.

24-HOUR ACTIVITY RHYTHM AND SLEEP DISTURBANCES IN DEPRESSION AND ANXIETY: A POPULATION-BASED STUDY OF MIDDLE-AGED AND OLDER PERSONS.

Luik AI¹, Zuurbier LA, Direk N, Hofman A, Van Someren EJ, Tiemeier H.

Author information

Abstract

BACKGROUND:

Disturbed circadian rhythms have been associated with depression and anxiety, but it is unclear if disturbances in the 24-hr activity rhythm and sleep are independently and specifically related to these disorders.

METHODS:

In 1,714 middle-aged and elderly participants of the Rotterdam Study, we collected actigraphy recordings of at least 96 hr (138 ± 14 hr, mean \pm standard deviation). Activity rhythms were quantified calculating the fragmentation of the rhythm, stability of the rhythm over days, and timing of the rhythm. Total sleep time, sleep onset latency, and wake after sleep onset were also estimated with actigraphy. Depressive symptoms were assessed with the Center for Epidemiologic Studies Depression scale, persons with clinically relevant depressive symptoms were interviewed to diagnose DSM-IV-depressive disorder. Anxiety disorders were determined with the Munich version of the Composite International Diagnostic Interview.

RESULTS:

More fragmented rhythms were associated with clinically relevant depressive symptoms (odds ratio (OR): 1.27, 95% confidence interval (CI): 1.04;1.54) and anxiety disorders (OR: 1.39, 95% CI: 1.14;1.70) after covariate adjustment. Less stable rhythms, longer sleep onset latency, and more wake after sleep onset were related to clinically relevant depressive symptoms or anxiety disorders only if not adjusted for covariates and other activity rhythm and sleep indicators.

CONCLUSIONS:

Our study in middle-aged and elderly persons suggests that fragmentation of the 24-hr activity rhythm is associated with depression and anxiety. Moreover, this association also largely accounts for the effect of disturbed sleep on these psychiatric disorders.

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KEYWORDS: actigraphy; aging; circadian rhythm; epidemiology; mood disorders

PMID: 25693731

**COMPLEX REGIONAL PAIN
FIBROMYALGIA
NUTRITION/VITAMINS**

High protein breakfast

A randomized, controlled, crossover trial to assess the acute appetitive and metabolic effects of sausage and egg-based convenience breakfast meals in overweight premenopausal women

Nutrition Journal, 02/24/2015 Rains TM, et al.

Results suggest that convenience meals providing 30 or 39 g protein/serving produce greater appetite control, lower postprandial glycemia and insulinemia, and reduced subsequent intake at lunch relative to a low-protein control, or no breakfast.

Methods

- The acute appetitive and metabolic effects of commercially-prepared sausage and egg-based breakfast meals at two different protein levels (30 g and 39 g/serving), vs. a low-protein pancake breakfast (3 g protein) and no breakfast (water), were examined in premenopausal women (N = 35; age 32.5 ± 1.6 yr; BMI 24.8 ± 0.5 kg/m²).
- Test products provided ~280 kcal/serving and similar fat (12–14 g) and fiber contents (0–1 g).
- Visual Analog Scale ratings for appetite (hunger, fullness, prospective consumption, desire to eat) and repeated blood sampling for plasma glucose and insulin concentrations were assessed throughout each test day.
- Energy intake was recorded at an ad libitum lunch meal at 240 min.

Results

- Results showed increased satiety ratings for both the 30 and 39 g protein meals vs. the low-protein and no breakfast conditions (p < 0.001 for all).
- Postprandial glucose and insulin excursions were lower following the 30 g and 39 g protein conditions vs. the low-protein condition, with smaller responses following the 39 g vs. 30 g protein condition (p < 0.05 for all).
- Energy intake at lunch was significantly less (p < 0.001) following the 39 g protein meal (692 kcal) vs. the low-protein and no breakfast conditions (789 and 810 kcal, respectively).
- Total energy intake from the test condition + lunch was higher (p < 0.01) for the 30 and 39 g meals (982 and 983 kcal, respectively) vs. no breakfast (810 kcal), and less than the low protein breakfast (1064 kcal; p < 0.01 vs. 39 g condition only).

Chocolate and weight gain

Obesity (Silver Spring). 2015 Mar;23(3):677-83. doi: 10.1002/oby.20983. Epub 2015 Feb 3.

Chocolate-candy consumption and 3-year weight gain among postmenopausal U.S. women.

Greenberg JA¹, Manson JE, Buijsse B, Wang L, Allison MA, Neuhouser ML, Tinker L, Waring ME, Isasi CR, Martin LW, Thomson CA.

Author information

Abstract**OBJECTIVE:**

To test the hypothesis that greater chocolate-candy intake is associated with more weight gain in postmenopausal women.

METHODS:

A prospective cohort study involved 107,243 postmenopausal American women aged 50-79 years (mean = 60.7) at enrollment in the Women's Health Initiative, with 3-year follow-up. Chocolate-candy consumption was assessed by food frequency questionnaire, and body weight was measured. Linear mixed models, adjusted for demographic, socio economic, anthropomorphic, and behavioral variables, were used to test our main hypotheses.

RESULTS:

Compared with women who ate a 1 oz (~28 g) serving of chocolate candy <1 per month, those who ate this amount 1 per month to <1 per week, 1 per week to <3 per week and ≥ 3 per week showed greater 3-year prospective weight gains (kg) of 0.76 (95% CI: 0.66, 0.85), 0.95 (0.84, 1.06), and 1.40 (1.27, 1.53), respectively, (P for linear trend <0.0001). Each additional 1 oz/day was associated with a greater 3-year weight gain (kg) of 0.92 (0.80, 1.05). The weight gain in each chocolate-candy intake level increased as BMI increased above the normal range (18.5-25 kg/m²), and was inversely associated with age.

CONCLUSIONS:

Greater chocolate-candy intake was associated with greater prospective weight gain in this cohort of postmenopausal women.

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PMID:25644711

Coffee and breast cancer

Breast Cancer Res. 2015 Jan 31;17(1):15.

Coffee and tea consumption and risk of pre- and postmenopausal breast cancer in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort study.

Bhoo-Pathy N, Peeters P, Uiterwaal C, Bueno-de-Mesquita H, Bulgiba AM, Bech B, Overvad K, Tjønneland A, Olsen A, Clavel-Chapelon F, Fagherazzi G, Perquier F, Teucher B, Kaaks R, Schütze M, Boeing H, Lagiou P, Orfanos P, Trichopoulou A, Agnoli C, Mattiello A, Palli D, Tumino R, Sacerdote C, van Duijnhoven F, Braaten T, Lund E, Skeie G, Redondo ML, Buckland G, Pérez M, Chirlaque MD, Ardanaz E, Amiano P, Wirfält E, Wallström P, Johansson I, Nilsson L, Khaw KT, Wareham N, Allen NE, Key TJ, Rinaldi S, Romieu I, Gallo V, Riboli E, van Gils CH.

Abstract

Introduction Specific coffee subtypes and tea may impact risk of pre- and post-menopausal breast cancer differently. We investigated the association between coffee (total, caffeinated, decaffeinated) and tea intake and risk of breast cancer. **Methods** A total of 335,060 women participating in the European Prospective Investigation into Nutrition and Cancer (EPIC) Study, completed a dietary questionnaire from 1992 to 2000, and were followed-up until 2010 for incidence of breast cancer. Hazard ratios (HR) of breast cancer by country-specific, as well as cohort-wide categories of beverage intake were estimated. **Results** During an average follow-up of 11 years, 1064 premenopausal, and 9134 postmenopausal breast cancers were diagnosed. Caffeinated coffee intake was associated with lower risk of postmenopausal breast cancer: adjusted HR_i=_i0.90, 95% confidence interval (CI): 0.82 to 0.98, for high versus low consumption; P trend_i=_i0.029. While there was no significant effect modification by hormone receptor status (P_i=_i0.711), linear trend for lower risk of breast cancer with increasing caffeinated coffee intake was clearest for estrogen and progesterone receptor negative (ER-PR-), postmenopausal breast cancer (P_i=_i0.008). For every 100 ml increase in caffeinated coffee intake, the risk of ER-PR- breast cancer was lower by 4% (adjusted HR: 0.96, 95% CI: 0.93 to 1.00). Non-consumers of decaffeinated coffee had lower risk of postmenopausal breast cancer (adjusted HR_i=_i0.89; 95% CI: 0.80 to 0.99) compared to low consumers, without evidence of dose_iresponse relationship (P trend_i=_i0.128).

Exclusive decaffeinated coffee consumption was not related to postmenopausal breast cancer risk, compared to any decaffeinated-low caffeinated intake (adjusted HR_i=_i0.97; 95% CI: 0.82 to 1.14), or to no intake of any coffee (HR: 0.96; 95%: 0.82 to 1.14). Caffeinated and decaffeinated coffee were not associated with premenopausal breast cancer. Tea intake was neither associated with pre- nor post-menopausal breast cancer. **Conclusions** Higher caffeinated coffee intake may be associated with lower risk of postmenopausal breast cancer. Decaffeinated coffee intake does not seem to be associated with breast cancer.

PMID:25637171

Folate and HA

Headache. 2015 Feb;55(2):301-9. doi: 10.1111/head.12490. Epub 2015 Jan 19.

Effects of dietary folate intake on migraine disability and frequency.

Menon S¹, Lea RA, Ingle S, Sutherland M, Wee S, Haupt LM, Palmer M, Griffiths LR.
Author information

Abstract**BACKGROUND:**

Migraine is a highly disabling disease affecting a significant proportion of the Australian population. The methylenetetrahydrofolate reductase (MTHFR) C677T variant has been associated with increased levels of homocysteine and risk of migraine with aura (MA). Folic acid (FA), vitamin B6, and B12 supplementation has been previously shown to reduce increased levels of homocysteine and decrease migraine symptoms. However, the influence of dietary folate intake on migraine has been unclear. The aim of the current study was to analyze the association of dietary folate intake in the form of dietary folate equivalent, FA, and total food folate (TFF) on migraine frequency, severity, and disability.

METHODS:

A cohort of 141 adult females of Caucasian descent with MA was genotyped for the MTHFR C677T variant using restriction enzyme digestion. Dietary folate information was collected from all participants and analyzed using the "FoodWorks" 2009 package. Folate consumption was compared with migraine frequency, severity, and disability using linear regression.

RESULTS:

A significant inverse relation was observed between dietary folate equivalent ($R(2) = 0.201$, $B = -0.002$, $P = .045$, 95% confidence interval [CI] [-0.004, -0.001]) and FA ($R(2) = 0.255$, $B = -0.005$, $P = .036$, 95% CI [-0.009, -0.002]) consumption and migraine frequency. It was also observed that in individuals with the CC genotype for the MTHFR C677T variant, migraine frequency was significantly linked to FA consumption ($R(2) = 0.106$, $B = -0.004$, $P = .029$, 95% CI [-0.007, -0.004]).

CONCLUSIONS:

The results from this study indicate that folate intake in the form of FA may influence migraine frequency in female MA sufferers.

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KEYWORDS:

dietary folate equivalent; folic acid; homocysteine; methylenetetrahydrofolate reductase C677T; migraine with aura

PMID:25598270

Pesticides and ADHD

Common pesticide may increase risk of ADHD

Rutgers Biomedical and Health Sciences News, 02/02/2015

Rutgers study suggests that pregnant women and young children are more susceptible. A commonly used pesticide may alter the development of the brain's dopamine system – responsible for emotional expression and cognitive function – and increase the risk of attention deficit hyperactivity disorder in children, according to a new Rutgers study. The research published Wednesday in the Journal of the Federation of American Societies for Experimental Biology (FASEB), by Rutgers scientists and colleagues from Emory University, the University of Rochester Medical Center, and Wake Forest University discovered that mice exposed to the pyrethroid pesticide deltamethrin in utero and through lactation exhibited several features of ADHD, including dysfunctional dopamine signaling in the brain, hyperactivity, working memory, attention deficits and impulsive-like behavior.

These findings provide strong evidence, using data from animal models and humans, that exposure to pyrethroid pesticides, including deltamethrin, may be a risk factor for ADHD.

PHARMACOLOGY

Cox 2 inhibitors and stroke

New research: Arthritis medicine linked to deaths

Aarhus University Health News, 11/17/2014

Use of often prescribed drugs against arthritis and pain increases the risk of dying from a stroke. This is the conclusion of a major new registry study involving more than 100,000 patients. Each year 15,500 Danes suffer a stroke caused by a blood clot or bleeding in the brain. Many of them suffer permanent injury and 4,700 die each year due to strokes, which makes suffering a stroke the third most frequent cause of death in Denmark. New research from Aarhus University and Aarhus University Hospital has now documented that the use of a number of widespread Arthritis drugs increases the risk of dying from a stroke. In the study researchers have taken a closer look at what are known as COX-2 inhibitors which are a special type of prescription-only arthritis medicine. They are found in both older and newer versions and are sold in Denmark under names such as Voltaren, Diclon and Todalac. "Some of the newer types of COX-2 inhibitor medicines have already been removed from the shelves again due to the increased risk of heart attacks, but many of the older medicines are still being widely prescribed.

Our study shows that the use of these arthritis drugs increases the risk of fatal strokes," says Clinical Associate Professor and MD Christian Fynbo Christiansen. He is behind the study together with colleagues from Aarhus University and Aarhus University Hospital.

Cannabis and stroke

Stroke. 2015 Mar;46(3):852-6. doi: 10.1161/STROKEAHA.115.008680.

Cannabis and stroke: systematic appraisal of case reports.

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Author information

Abstract

BACKGROUND AND PURPOSE:

An increasing number of case reports link cannabis consumption to cerebrovascular events. Yet these case reports have not been scrutinized using criteria for causal inference.

METHODS:

All case reports on cannabis and cerebrovascular events were retrieved. Four causality criteria were addressed: temporality, adequacy of stroke work-up, effects of rechallenge, and concomitant risk factors that could account for the cerebrovascular event.

RESULTS:

There were 34 case reports on 64 patients. Most cases (81%) exhibited a temporal relationship between cannabis exposure and the index event. In 70%, the evaluation was sufficiently comprehensive to exclude other sources for stroke. About a quarter (22%) of patients had another stroke after subsequent re-exposure to cannabis. Finally, half of patients (50%) had concomitant stroke risk factors, most commonly tobacco (34%) and alcohol (11%) consumption.

CONCLUSIONS:

Many case reports support a causal link between cannabis and cerebrovascular events. This accords well with epidemiological and mechanistic research on the cerebrovascular effects of cannabis.

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KEYWORDS: case management; epidemiology; risk factors; stroke; substance-related disorders

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Cannabinoids and nausea

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The role of cannabinoids in regulation of nausea and vomiting, and visceral pain.

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Abstract

Marijuana derived from the plant *Cannabis sativa* has been used for the treatment of many gastrointestinal (GI) disorders, including anorexia, emesis, abdominal pain, diarrhea, and others. However, its psychotropic side effects have often limited its use. Several cannabinoid receptors, which include the cannabinoid receptor 1 (CB1), CB2, and possibly GPR55, have been identified throughout the GI tract. These receptors may play a role in the regulation of food intake, nausea and emesis, gastric secretion and gastroprotection, GI motility, ion transport, visceral sensation, intestinal inflammation, and cell proliferation in the gut. However, the regulation of nausea and vomiting by cannabinoids and the endocannabinoid system has shed new knowledge in this field. Thus far, despite evidence of visceral sensitivity inhibition in animal models, data in irritable bowel syndrome (IBS) patients is scarce and not supportive. Furthermore, many compounds that either act directly at the receptor or increase (or reduce) ligand availability have the potential to affect other brain functions and cause side effects.

Novel drug targets such as FAAH and monoacylglycerol lipase (MAGL) inhibitors appear to be promising in animal models, but more studies are necessary to prove their efficiency. The promise of emerging drugs that are more selective and peripherally acting suggest that, in the near future, cannabinoids will play a major role in managing an array of GI diseases.

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ELECTROTHERAPY

NEUROLOGICAL CONDITIONS