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LUMBAR SPINE**Spondylo**

[Spine J.](#) 2014 Aug 12. pii: S1529-9430(14)00782-7. doi: 10.1016/j.spinee.2014.08.006.

Sensitivity of Magnetic Resonance Imaging in the Diagnosis of Mobile and Non-Mobile L4-5 Degenerative Spondylolisthesis.

[Kuhns BD](#)¹, [Kouk S](#)¹, [Buchanan C](#)², [Lubelski D](#)³, [Alvin MD](#)¹, [Benzel EC](#)⁴, [Mroz TE](#)⁵, [Tozzi J](#)⁶.

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

Lumbar Degenerative Spondylolisthesis (LDS) is often diagnosed by conventional supine magnetic resonance imaging (MRI). Numerous studies have shown, however, that the degree of spondylolisthesis can be reduced or disappear when the patient is supine as compared to standing lateral and flexion-extension (SLFE) radiographs.

PURPOSE:

To compare the sensitivity of supine MRI to SLFE radiographs in patients with L4-5 LDS.

STUDY DESIGN/SETTING:

Retrospective imaging study.

PATIENT SAMPLE:

Patients diagnosed with L4-5 LDS with both SLFE films and supine MRI METHODS: LDS was defined radiographically as a slip greater than 4.5 mm. Mobile LDS was defined as a difference of greater than 3% in slip percentage between lateral radiographs and sagittal MRIs. Additional measurements included L4-5 facet effusion diameter on axial MRIs. Measurements were performed by two independent examiners. The kappa coefficient was used to assess inter-observer agreement.

RESULTS:

Of 103 patients assessed, 68% were female and the average age was 66 years. LDS was seen on 101 (98%) lateral films and 80 (78%) MRIs. Average slip was 10.0 mm for lateral standing radiographs and 6.6 mm on MRI ($p < 0.0001$). 50 (48%) patients were identified with mobile LDS. The positive predictive value of facet joint effusion for mobile LDS increased from 52% for effusions greater than 1mm to 100% for patients with effusions greater than 3.5mm.

CONCLUSIONS:

This study found that MRI had a sensitivity of 78% for detecting L4-5 LDS compared to 98% for lateral standing films. We also identified facet effusion size as a marker to predict for mobile LDS. These findings suggest that, particularly in the setting of facet effusions, the complete workup of patients in whom LDS is possible should include standing radiographs.

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PMID: 25130777

LBP

Catorgoization

Man Ther. 2014 Aug 12. pii: S1356-689X(14)00143-X. doi: 10.1016/j.math.2014.07.015.

Multidimensional pain profiles in four cases of chronic non-specific axial low back pain: An examination of the limitations of contemporary classification systems.

Rabey M¹, Beales D², Slater H², O'Sullivan P².

Author information

Abstract

Classifying patients with chronic low back pain (CLBP) may facilitate targeted treatment, and optimise outcomes. Most classification systems (CS) do not consider multiple, interacting dimensions (for example, psychological or movement dimensions) involved in the lived experience of people with CLBP. A framework incorporating these multiple dimensions, and acknowledging individual variability, could provide a pathway to better assess and treat people with CLBP. Here we explored this proposition, presenting four cases (P1-4), profiling their clinical presentations within a multidimensional framework. P1's profile was characterised by localised lumbar sensitisation consistent with dominant peripheral nociception. P2 presented a 'mixed' profile characterised by localised lumbar hypersensitivity, combined with factors suggestive of centrally-mediated facilitation of nociception. P3's profile suggested widespread hypersensitivity possibly reflective of dominant centrally-mediated pain mechanisms. P4's profile was characterised by dominant psychosocial factors and comorbidities. These cases are discussed in relation to contemporary CLBP CS, highlighting the complexity of these disorders and limitations of CS for people with CLBP and their treating health professionals. This paper reinforces the need for a consensus CS for people with CLBP that is flexible, has clinical utility and considers all relevant dimensions.

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KEYWORDS: Back pain; Biopsychosocial; Classification PMID: 25153893

Whole body vibrations

Int Arch Occup Environ Health. 2014 Aug 21. [Epub ahead of print]

Whole-body vibration and the risk of low back pain and sciatica: a systematic review and meta-analysis.

Burström L¹, Nilsson T, Wahlström J.

Author information

Abstract

PURPOSE:

The aim of this systematic literature review was to evaluate the association between whole-body vibration (WBV) and low back pain (LBP) and sciatica with special attention given to exposure estimates. Moreover, the aim was to estimate the magnitude of such an association using meta-analysis and to compare our findings with previous reviews.

METHODS:

The authors systematically searched the PubMed (National Library of Medicine, Bethesda), Nioshtic2 (National Institute for Occupational Safety and Health (NIOSH, Morgantown), and ScienceDirect (Elsevier, Amsterdam) databases for records up to December 31, 2013. Two of the authors independently assessed studies to determine their eligibility, validity, and possible risk of bias.

RESULTS:

The literature search gave a total of 306 references out of which 28 studies were reviewed and 20 were included in the meta-analysis. Exposure to WBV was associated with increased prevalence of LBP and sciatica [pooled odds ratio (OR) = 2.17, 95 % confidence interval (CI) 1.61-2.91 and OR 1.92, 95 % CI 1.38-2.67, respectively]. Workers exposed to high vibration levels had a pooled risk estimate of 1.5 for both outcomes when compared with workers exposed to low levels of vibration. The results also indicate that some publication bias could have occurred especially for sciatica.

CONCLUSIONS: This review shows that there is scientific evidence that exposure to WBV increases the risk of LBP and sciatica. PMID: 25142739

LBP/INJECTIONS

Injections and piriformis syndrome

Lumbar facet injection for the treatment of chronic piriformis myofascial pain syndrome:

52 case studies *Full Text*

Patient Preference and Adherence, 08/29/2014 Clinical Article

Huang JT, et al.

Background and aims: The aim of this study was to demonstrate the effectiveness of lumbar facet joint injection for piriformis myofascial pain syndrome.

Methods: Fifty-two patients with chronic myofascial pain in the piriformis muscle each received a lumbar facet injection into the ipsilateral L5–S1 facet joint region, using the multiple insertion technique. Subjective pain intensity, trunk extension range, and lumbar facet signs were measured before, immediately after, and 2 weeks after injection. Thirty-six patients received follow-up for 6 months.

Results: Immediately after the injection, 27 patients (51.9%) had complete pain subsidence, 19 patients (36.5%) had pain reduction to a tolerable level, and only 6 patients (11.5%) had no pain relief to a tolerable level. Mean pain intensity was reduced from 7.4 ± 0.9 to 1.6 ± 2.1 after injection ($P < 0.01$). This effectiveness lasted for 2 weeks in 49 patients (94.2%), and lasted for approximately 6 months in 35 (97.2%) of 36 patients. The mean range of motion increased from 13.4 ± 6.8 degrees to 22.1 ± 6.0 degrees immediately after injection, and further increased 2 weeks and 6 months later. Immediately after injection, 45 patients (86.5%) had no facet sign. In addition, 90.4% and 94.4% of patients had no facet sign after 2 weeks and after 6 months, respectively.

Conclusions: It is important to identify the possible cause of piriformis myofascial pain syndrome. If this pain is related to lumbar facet lesions, lumbar facet joint injection can immediately suppress piriformis myofascial pain symptoms. This effectiveness may last for at least 6 months in most patients. This study further supports the importance of eliminating the underlying etiological lesion for complete and effective relief of myofascial pain syndrome.

Keywords: facet joints, injection, piriformis, chronic myofascial pain, pain intensity, range of motion, lumbar facet sign

VISCERA

Dysmenorrhea

Review of frequency of dysmenorrhea and some associated factors and evaluation of the relationship between dysmenorrhea and sleep quality in university students

Gynecologic and Obstetric Investigation, 08/25/2014 Review Article

Sahin S, et al

abstract

Objective: To determine the frequency of dysmenorrhea in university students, review some associated factors and evaluate the relationship between dysmenorrhea and sleep quality.

Material and Methods: The study group included 520 students. Survey forms prepared previously in line with the study objective were completed by the students under supervision. The severity of dysmenorrhea was rated with Visual Analogue Scale. Pittsburgh Sleep Quality Index was used to evaluate the sleep quality. The χ^2 test, Mann-Whitney U test and Kruskal-Wallis test were used for the analyses. Statistical significance level was accepted at $p < 0.05$.

Results: Mean age of the students was 20.23 ± 1.59 years (range 17-25). Frequency of dysmenorrhea was determined to be 69.0% ($n = 359$). Frequency of dysmenorrhea was higher in smokers, those with menstrual irregularity, those who use drugs for menstrual regulation and those having a family history ($p < 0.05$ for each). The most frequent symptoms in those having dysmenorrhea history were weakness (59.6%), fatigue (58.5%) and breast tenderness (45.4%), respectively. Sleep quality was found to be poorer in the students having a history of dysmenorrhea ($p < 0.05$).

Conclusions: Dysmenorrhea is an important health problem in young women. Dysmenorrhea affects the sleep quality negatively. © 2014 S. Karger AG, Basel

Central sensitization and IBS

J Pain. 2014 Jun 4. pii: S1526-5900(14)00740-8. doi: 10.1016/j.jpain.2014.05.007.

Widespread Hyperalgesia in Adolescents With Symptoms of Irritable Bowel Syndrome: Results From a Large Population-Based Study.

Stabell N¹, Stubhaug A², Flægstad T³, Mayer E⁴, Naliboff BD⁵, Nielsen CS⁶.

Abstract

Widespread hyperalgesia is well documented among adult patients with irritable bowel syndrome (IBS), but little is known about pain sensitivity among adolescents with IBS. We examined pain sensitivity in 961 adolescents from the general population (mean age 16.1 years), including pain threshold and tolerance measurements of heat (forearm) and pressure pain (fingernail and shoulder) and cold pressor tolerance (hand). Adolescents with IBS symptoms (Rome III criteria) had lower heat pain thresholds compared to controls after adjustments for sex, comorbid pain, and psychological distress (mean difference = -0.8°C ; 95% confidence interval [CI] = -1.6 to -.04). Similar results were found for pressure pain threshold at the shoulder (mean difference = -46 kPa ; 95% CI = -78 to -13) and fingernail (mean difference = -62 kPa ; 95% CI = -109 to -15), and for an aggregate of all 3 threshold measures (z-score difference = -0.4 ; 95% CI = -0.6 to -0.2), though pressure pain threshold differences were nonsignificant after the final adjustments for psychological distress. No difference of pain tolerance was found between the IBS cases and controls. Our results indicate that adolescents in the general population with IBS symptoms, like adults, have widespread hyperalgesia.

PERSPECTIVE:

This is the first report of widespread hyperalgesia among adolescents with IBS symptoms in the general population, with lower pain thresholds found to be independent of sex and comorbid pain. Our results suggest that central pain sensitization mechanisms in IBS may contribute to trigger and maintain chronic pain symptoms.

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KEYWORDS: Widespread hyperalgesia; adolescents; comorbidity; irritable bowel syndrome; quantitative pain sensitivity testing PMID: 24905280

Joint hypermobility and GI

Joint hypermobility: a common association with complex functional gastrointestinal disorders

The Journal of Pediatrics, 08/25/2014 Clinical Article

Kovacic K, et al.

Objective

To evaluate the prevalence of joint hypermobility (JH) and comorbid conditions in children and young adults referred to a tertiary care neurogastroenterology and autonomic disorders clinic for functional gastrointestinal complaints.

Study design

This was a retrospective chart review of 66 new patients aged 5-24 years who fulfilled at least 1 pediatric Rome III criteria for a functional gastrointestinal disorder (FGID) and had a recorded Beighton score (n = 45) or fibromyalgia tender point score (n = 45) based on physician examination. Comorbid symptoms were collected and autonomic testing was performed for evaluation of postural tachycardia syndrome (POTS).

Results

The median patient age was 15 years (range, 5-24 years), 48 (73%) were females, and 56% had JH, a significantly higher rate compared with population studies of healthy adolescents ($P < .001$; OR, 10.03; 95% CI, 5.26-19.13). POTS was diagnosed in 34% of patients and did not correlate significantly with hypermobility. Comorbid conditions were common, including sleep disturbances (77%), chronic fatigue (93%), dizziness (94%), migraines (94%), chronic nausea (93%), and fibromyalgia (24%).

Conclusion

JH and other comorbid symptoms, including fibromyalgia, occur commonly in children and young adults with complex FGIDs. POTS is prevalent in FGIDs but is not associated with hypermobility. We recommend screening patients with complex FGIDs for JH, fibromyalgia, and comorbid symptoms such as sleep disturbances, migraines, and autonomic dysfunction.

CERVICAL SPINE

Flexion testing

J Back Musculoskelet Rehabil. 2014 Aug 26.

Influence of pressure changes on recruitment pattern and neck muscle activities during Cranio-Cervical Flexion Tests (CCFTs).

Park J¹, Hur J¹, Ko T².

Abstract

BACKGROUND:

The muscle activity of the deep cervical flexors is emphasized more than that of the superficial cervical flexors, and it has been reported that functional disorders of the longuscolli are found in patients who experience neck pain.

OBJECTIVE:

The objective of this study was to analyze the recruitment patterns and muscle activities of the cervical flexors during Cranio-Cervical Flexion Tests (CCFTs) through real-time ultrasonography and surface electromyography with a view to presenting appropriate pressure levels for deep cervical flexor exercise protocols based on the results of the analysis.

METHODS:

The twenty subjects without neck pain were trained until they became accustomed to CCFTs, and the pressure level was increased gradually from 20 mmHg to 40 mmHg by increasing the pressure level 5 mmHg at a time. Real-time ultrasonography images of the longuscolli and the sternocleidomastoid were taken to measure the amounts of changes in the thicknesses of these muscles, and surface electromyography was implemented to observe the muscle activity of the sternocleidomastoid. The measured value is RMS.

RESULTS:

According to the results of the ultrasonography, the muscle thicknesses of both the longuscolli and the sternocleidomastoid showed significant increases, as the pressure increased up to 40 mmHg ($p < 0.05$). The differences in the muscle thicknesses at all individual pressure levels showed significant increases ($p < 0.05$). According to the results of the electromyography, the muscle activity of the sternocleidomastoid gradually increased as the pressure increased up to 40 mmHg, the increases were significant between 20 mmHg and 25 mmHg, between 30 mmHg and 35 mmHg ($p < 0.05$).

CONCLUSIONS:

The pressure levels of exercise methods at which the muscle activity of the deep cervical flexors is maximally increased and the muscle activity of the superficial cervical flexors is minimally increased are 25 mmHg-30 mmHg.

KEYWORDS: Cranio-cervical flexion test; longuscolli; real-time ultrasonography; surface electromyography PMID: 25159290

Whiplash

J Pain. 2014 Jul 1. pii: S1526-5900(14)00793-7. doi: 10.1016/j.jpain.2014.06.010.

Measures of Spontaneous and Movement-Evoked Pain are Associated with Disability in Patients with Whiplash Injuries.

Mankovsky-Arnold T¹, Wideman TH², Larivière C³, Sullivan MJ⁴.

Abstract

This study examined the degree to which measures of spontaneous and movement-evoked pain accounted for shared or unique variance in functional disability associated with whiplash injury. The study also addressed the role of fear of movement as a mediator or moderator of the relation between different indices of pain and functional disability. Measures of spontaneous pain, single-point movement-evoked pain, repetition induced summation of activity-related pain (RISP), fear of movement and disability were obtained on a sample of 142 individuals who had sustained whiplash injuries. Participants' pain ratings provided after lifting a weighted canister were used as the index of single-point movement-evoked pain. RISP was computed as the increase in pain reported by participants over successive lifts of 18 weighted canisters. Measures of functional disability included physical lift tolerance and self-reported disability. Hierarchical regression analyses revealed that the single-point movement-evoked pain and RISP accounted for significant unique variance in self-reported disability, beyond the variance accounted for by the measure of spontaneous pain. Only RISP accounted for significant unique variance in lift tolerance. The results suggest that measures of movement-evoked pain represent a disability-relevant dimension of pain that is not captured by measures of spontaneous pain. The clinical and conceptual implications of the findings are discussed.

PERSPECTIVE:

This study examined the degree to which measures of spontaneous and movement-evoked pain accounted for shared or unique variance in functional disability associated with whiplash injury. The findings suggest that approaches to the clinical evaluation of pain would benefit from the inclusion of measures of movement-evoked pain.

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KEYWORDS: disability; evoked pain; fear; movement; pain; whiplash PMID: 24998695

HEADACHES

Impact of education

Pain Med. 2014 Aug 26. doi: 10.1111/pme.12505.

Effectiveness of Therapeutic Patient Education for Adults with Migraine. A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

Kindelan-Calvo P¹, Gil-Martínez A, Paris-Aleman A, Pardo-Montero J, Muñoz-García D, Angulo-Díaz-Parreño S, La Touche R.

Abstract

OBJECTIVE:

Our aim was to systematically review and meta-analyze the effectiveness of therapeutic patient education for migraine.

METHODS:

A literature search of multiple electronic databases (MEDLINE, EMBASE, PEDro, CINAHL, and PsychINFO) was conducted to identify randomized control trials (RCTs) published in the English and Spanish languages up to and including May 2013. Two reviewers independently selected the studies, conducted the quality assessment (Delphi list), and extracted the results. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses method was used throughout the systematic review and meta-analysis. Standardized mean difference (SMD) and 95% confidence intervals (CIs) were calculated for relevant outcome measures (headache frequency, headache disability, self-efficacy, depressive symptoms, and quality of life) and pooled in a meta-analysis using the random effects model.

RESULTS:

Fourteen RCTs were included in the systematic review. Only nine studies were included in the meta-analysis. The median quality score was 6.14 ± 1.29 (range: 5-9). There was strong-moderate evidence for intermediate-term effectiveness of therapeutic patient education on headache frequency (five studies: $N = 940$, $SMD = -0.24$, 95% CI of -0.48 to -0.01, $P = 0.03$), headache disability (four studies: $N = 799$, $SMD = -1.02$, 95% CI of -1.95 to -0.08, $P = 0.03$), and quality of life (three studies: $N = 674$, $SMD = 0.36$, 95% CI of 0.05-0.67, $P = 0.02$). There was no evidence for either short-term or intermediate-term effectiveness of therapeutic patient education on self-efficacy or depressive symptoms.

CONCLUSION:

This systematic review revealed strong-moderate evidence for intermediate-term effectiveness of therapeutic patient education for migraine. Further high-quality RCTs are required for conclusive determination of its effectiveness.

Wiley Periodicals, Inc.

KEYWORDS: Behavioral Treatment; Headache Disability; Headache Frequency; Meta-Analysis; Migraine; Systematic Review; Therapeutic Education PMID: 25159212

Adolescents and activity

Relationship of childhood headaches with preferences in leisure time activities, depression, anxiety and eating habits: A population-based, cross-sectional study

Cephalalgia, 08/25/2014 Clinical Article

Bektas O, et al

Abstract

Objectives The objective of this article is to determine the relationship between headache frequency and socio-demographic data, personal characteristics, habits, daily activities, daily loss of ability, depression and anxiety in the headache subtypes in the pediatric population.

Patients and methods Our sample group was composed of approximately 5355 children aged between 9 and 18 years. An eight-stage questionnaire was administered to the children. In the second stage of the study, headache subtypes were created according to the ICHD-II criteria. The resulting data were compared according to the results of the headache subtypes.

Results In school-age children, the prevalence of recurrent headaches was 39.4%, and the prevalence of migraine was 10.3%. The subjects with migraine mostly preferred sedentary activities in their leisure time, and preferred less exercise than the subjects with the other headache types. The PedMIDAS score of the children who preferred to play sports was significantly lower than those who did not prefer to play sports. In the group that preferred reading books, an opposite relationship was found. In overweight and obese migraine sufferers, other types of headache were found to be significantly higher.

Conclusions In the management of treating childhood headaches, the association of psychiatric comorbidities should be considered. To minimize disability, children should be directed to more useful physical activities.

CONCUSSIONS

Risk of additional injuries

Br J Sports Med. 2014 Jul 31. pii: bjsports-2013-093406. doi: 10.1136/bjsports-2013-093406.

Sports-related concussion increases the risk of subsequent injury by about 50% in elite male football players.

Nordström A¹, Nordström P², Ekstrand J³.

Abstract

BACKGROUND:

Little is known about the short-term and long-term sequelae of concussion, and about when athletes who have sustained such injuries can safely return to play.

PURPOSE:

To examine whether sports-related concussion increases the risk of subsequent injury in elite male football players.

STUDY DESIGN:

Prospective cohort study.

METHODS:

Injuries were registered for 46 male elite football teams in 10 European countries in the 2001/2002-2011/2012 seasons. Two survival models were used to analyse whether concussion increased the subsequent risk of an injury in the first year.

RESULTS:

During the follow-up period, 66 players sustained concussions and 1599 players sustained other injuries. Compared with the risk following other injuries, concussion was associated with a progressively increased risk of a subsequent injury in the first year (0 to <3 months, HR=1.56, 95% CI 1.09 to 2.23; 3 to <6 months, HR=2.78, 95% CI 1.58 to 4.89; 6-12 months, HR=4.07, 95% CI 2.14 to 7.76). In the second model, after adjustment for the number of injuries in the year preceding the concussion, this injury remained significantly associated with the risk of subsequent injury in the first year (HR=1.47, 95% CI 1.05 to 2.05).

CONCLUSIONS:

Concussion was a risk factor for sustaining subsequent injury within the following year. In-depth medical evaluation, which includes neurological and cognitive assessment, is warranted within the concussion management and return-to-play process.

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KEYWORDS: Concussion PMID: 25082616

SHOULDER GIRDLE

Depressed scapula position

Man Ther. 2014 Aug 1. pii: S1356-689X(14)00142-8. doi: 10.1016/j.math.2014.07.014. [

Study of the trapezius muscle region pressure pain threshold and latency time in young people with and without depressed scapula.

Lee KT¹, Chuang CC², Lai CH³, Ye JJ¹, Wu CL⁴.

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- ⁴Division of Acupuncture, Linsen Chinese Medicine Branch, Taipei City Hospital, Taipei 110, Taiwan, ROC.

Abstract

The scapula is stabilized in or moved to a certain position to coordinate shoulder function and achieve shoulder and arm movement during the athletic and daily activities. An alteration in the scapular position both at rest and during arm movements is commonly associated with shoulder injury or dysfunction. The purpose of this study was to assess the influence of the depressed scapular position using pressure pain threshold (PPT) and delayed muscle activation of the upper and middle trapezius muscles. The study included 20 subjects who were divided into normal shoulder (n = 12) and depressed shoulder (n = 8) group. PPT was measured in a relaxed position. Muscle activity was recorded using surface electromyography and by calculating each shrug's muscle latency time (MLT).

The results revealed that the healthy young subjects with depressed scapular position had significantly lower PPT levels than those with normal scapular position both in the upper and middle trapezius muscle ($P < 0.05$). MLT of the upper trapezius was significantly delayed in both sides during the shoulder shrugs ($P < 0.05$).

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KEYWORDS: Electromyography; Pressure pain threshold; Scapula; Trapezius muscles
PMID: 25130137

GLENOHUMERAL/SHOULDER

Hip abductor and adductor strength

Clin J Sport Med. 2014 Sep;24(5):422-8. doi: 10.1097/JSM.0000000000000059.

Comparison of isokinetic hip abduction and adduction peak torques and ratio between sexes.

Sugimoto D¹, Mattacola CG, Mullineaux DR, Palmer TG, Hewett TE.

Abstract

OBJECTIVE:

To evaluate hip abductor and adductor peak torque outputs and compare their ratios between sexes.

DESIGN:

A cross-sectional laboratory-controlled study.

SETTING:

Participants visited a laboratory and performed an isokinetic hip abductor and adductor test. All participants performed 2 sets of 5 repetitions of concentric hip abduction and adduction in a standing position at 60 degrees per second. Gravity was determined as a function of joint angle relative to the horizontal plane and was corrected by normalizing the weight of the limb on an individual basis.

PARTICIPANTS:

A total of 36 collegiate athletes.

INDEPENDENT VARIABLES:

Sex (20 females and 16 males).

MAIN OUTCOME MEASURES:

Bilateral peak hip abductor and adductor torques were measured. The 3 highest peak torque values were averaged for each subject.

RESULTS:

Independent t tests were used to compare sex differences in hip abductor and adductor peak torques and the abductor:adductor peak torque ratios. Males demonstrated significantly greater hip abductor peak torque compared with females (males 1.29 ± 0.24 Nm/kg, females 1.13 ± 0.20 Nm/kg; $P = 0.03$). Neither hip adductor peak torque nor their ratios differed between sexes.

CONCLUSIONS:

Sex differences in hip abductor strength were observed. The role of weaker hip abductors in females deserves further attention and may be a factor for higher risk of knee pathologies.

PMID: 24905541

Dislocations

Br J Sports Med. 2014 Aug 5. pii: bjsports-2014-093718. doi: 10.1136/bjsports-2014-093718.

The epidemiology of 1345 shoulder dislocations and subluxations in French Rugby Union players: a five-season prospective study from 2008 to 2013.

Bohu Y¹, Klouche S², Lefevre N², Peyrin JC³, Dusfour B⁴, Hager JP³, Ribaut A⁵, Herman S².

Abstract

BACKGROUND:

An understanding of the epidemiology of shoulder dislocation/subluxation in rugby union players could help develop targeted prevention programmes and treatment. We performed a multiyear epidemiological survey of shoulder dislocation/subluxation in a large cohort of rugby players.

METHODS:

A descriptive epidemiological study was performed prospectively for five playing seasons (2008-2013) in all players licensed in the French Rugby Union. Rugby players were categorised into five groups by age. The player and the team physician reported the injury to the club insurance company if it occurred during training or a match. The goals of the study were to define the rate, type and causes of shoulder dislocation/subluxation.

RESULTS:

88 044 injuries were reported, including 1345 (1.5%) episodes of dislocation/subluxation in 1317 men and 28 women, mean age 22.5±5.9 years. About 10/10 000 men and 5/10 000 women reported an episode of shoulder dislocation/subluxation per season, including 83/10 000 senior professionals, 17/10 000 senior amateurs, 21/10 000 juniors, 12/10 000 cadets and <1/10 000 rugby school players. Shoulder dislocation/subluxation was significantly more frequent in senior and junior players ($p<0.001$). Injuries mainly occurred during a match (66%) in the middle of the season (44%). The most frequent playing position was forwards (56%) and the main mechanism was tackling (69%). When reported, the history of recurrence was found in 66% of injured players, fractures in 22% and acromioclavicular injury in 6.7%. Nerve injury was associated with shoulder dislocation in 6% of cases.

CONCLUSIONS:

Senior professionals and junior male forward rugby players with a history of shoulder dislocation/subluxation should receive special attention from sports medicine professionals and orthopaedic surgeons.

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KEYWORDS: Rugby; Shoulder; Sporting injuries PMID: 25097059

ADHESIVE CAPSULITIS

PT

Man Ther. 2014 Jul 18. pii: S1356-689X(14)00134-9. doi: 10.1016/j.math.2014.07.006.

Frozen shoulder contracture syndrome - Aetiology, diagnosis and management.

Lewis J.

Abstract

Frozen shoulder is a poorly understood condition that typically involves substantial pain, movement restriction, and considerable morbidity. Although function improves overtime, full and pain free range, may not be restored in everyone. Frozen shoulder is also known as adhesive capsulitis, however the evidence for capsular adhesions is refuted and arguably, this term should be abandoned. The aim of this Masterclass is to synthesise evidence to provide a framework for assessment and management for Frozen Shoulder. Although used in the treatment of this condition, manipulation under anaesthetic has been associated with joint damage and may be no more effective than physiotherapy. Capsular release is another surgical procedure that is supported by expert opinion and published case series, but currently high quality research is not available. Recommendations that supervised neglect is preferable to physiotherapy have been based on a quasi-experimental study associated with a high risk of bias. Physiotherapists in the United Kingdom have developed dedicated care pathways that provide; assessment, referral for imaging, education, health screening, ultrasound guided corticosteroid and hydro-distension injections, embedded within physiotherapy rehabilitation.

The entire pathway is provided by physiotherapists and evidence exists to support each stage of the pathway. Substantial on-going research is required to better understand; epidemiology, patho-aetiology, assessment, best management, health economics, patient satisfaction and if possible prevention.

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KEYWORDS: Assessment; Frozen shoulder; Management PMID: 25107826

ROTATOR CUFF

Brachial plexus injury and RCT

J Bone Joint Surg Am. 2014 Aug 20;96(16):e139. doi: 10.2106/JBJS.L.00420.

Prevalence of rotator cuff tears in adults with traumatic brachial plexus injuries.

Brogan DM, Carofino BC, Kircher MF, Spinner RJ, Elhassan BT, Bishop AT, Shin AY.

Abstract

BACKGROUND:

Restoration of shoulder function is a primary goal when treating patients with traumatic brachial plexus injury. A concomitant rotator cuff tear may alter the treatment approach and prognosis for these individuals. The purpose of this study was to define the prevalence of rotator cuff tears in patients with traumatic brachial plexus injuries.

METHODS:

This is a retrospective review of 280 adult patients with traumatic brachial plexus injury treated at a single institution over a twelve-year period. An upper-extremity magnetic resonance imaging (MRI) scan was acquired for all patients as part of the initial evaluation for posttraumatic brachial plexus injury. The radiographic and clinical data on these patients were reviewed to document partial or full-thickness rotator cuff tears, mechanism and location of the brachial plexus injury, and age.

RESULTS:

Twenty-three patients (8.2%) had a full-thickness rotator cuff tear: one patient had tears involving three tendons, eight patients had tears involving two tendons, twelve patients had a single-tendon tear, one patient had a single-tendon tear in each shoulder, and one patient had a single-tendon tear in one shoulder and a two-tendon tear in the other. Twenty-one tears involved the supraspinatus, eight involved the infraspinatus, and seven involved the subscapularis. Thirteen patients underwent surgical repair of the rotator cuff. The average age of the patients in this cohort was 33.4 years, and older age was associated with an increased risk of full-thickness rotator cuff tears (odds ratio [OR], 1.06 per year). Patients with infraclavicular brachial plexus injury had a significantly higher rate of full-thickness rotator cuff tears.

CONCLUSIONS:

Concomitant rotator cuff tears are present in approximately one in ten patients with traumatic brachial plexus injury. These injuries may contribute to shoulder dysfunction; therefore, evaluation of the rotator cuff with imaging studies is appropriate when formulating treatment strategies.

LEVEL OF EVIDENCE:

Prognostic Level IV. See Instructions for Authors for a complete description of levels of evidence. Copyright © 2014 by The Journal of Bone and Joint Surgery, Incorporated. PMID: 25143507

IMPINGEMENT

Impact of employment

Occup Environ Med. 2014 Aug 1. pii: oemed-2014-102161. doi: 10.1136/oemed-2014-102161.

Cumulative occupational shoulder exposures and surgery for subacromial impingement syndrome: a nationwide Danish cohort study.

Dalbøge A¹, Frost P¹, Andersen JH², Svendsen SW².

Abstract

OBJECTIVES:

The primary aim was to examine exposure-response relationships between cumulative occupational shoulder exposures and surgery for subacromial impingement syndrome (SIS), and to compare sex-specific exposure-response relationships. The secondary aim was to examine the time window of relevant exposures.

METHODS:

We conducted a nationwide register study of all persons born in Denmark (1933-1977), who had at least 5 years of full-time employment. In the follow-up period (2003-2008), we identified first-time events of surgery for SIS. Cumulative exposure estimates for a 10-year exposure time window with a 1-year lag time were obtained by linking occupational codes with a job exposure matrix. The exposure estimates were expressed as, for example, arm-elevation-years in accordance with the pack-year concept of tobacco consumption. We used a multivariable logistic regression technique equivalent to discrete survival analysis.

RESULTS:

The adjusted OR (OR_{adj}) increased to a maximum of 2.1 for arm-elevation-years, repetition-years and force-years, and to 1.5 for hand-arm-vibration-years. Sex-specific exposure-response relationships were similar for men and women, when assessed using a relative risk scale. The OR_{adj} increased gradually with the number of years contributing to the cumulative exposure estimates. The excess fraction was 24%.

CONCLUSIONS:

Cumulative occupational shoulder exposures carried an increase in risk of surgery for SIS with similar exposure-response curves for men and women. The risk of surgery for SIS increased gradually, when the period of exposure assessment was extended. In the general working population, a substantial fraction of all first-time operations for SIS could be related to occupational exposures.

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KEYWORDS: Acromioplasty; Job exposure matrix; Sex; Shoulder disorders; Time window
PMID: 25085767

Surgery

Alcohol use complications

Journal of Shoulder and Elbow Surgery DOI: <http://dx.doi.org/10.1016/j.jse.2014.05.019>

Analysis of perioperative morbidity and mortality in shoulder arthroplasty patients with preexisting alcohol use disorders

Brent A. Ponce, MD 

Background

Shoulder arthroplasty is becoming increasingly popular in the United States. Given the high prevalence of alcohol abuse and its implications in postoperative morbidity and the increasing incidence of shoulder arthroplasty, it is prudent to explore the effect of alcohol use disorders (AUDs) in this patient population. In this study, we considered numerous outcome variables, including perioperative complications, in-hospital death, prolonged hospital stay, and nonroutine discharge.

Methods

Using the Nationwide Inpatient Sample, we performed a retrospective cohort study to identify a population of 422,371 adults (≥ 18 years old) undergoing total shoulder arthroplasty or hemiarthroplasty between January 1, 2002, and December 31, 2011. We then further subdivided this cohort into those who were classified as having AUDs and those who did not. Comparisons of early postoperative outcome measures were performed by bivariate and multivariable analyses with logistic regression modeling.

Results

Compared with those without AUDs, patients undergoing shoulder arthroplasty with a preexisting AUD have a greater likelihood to experience death, pneumonia, deep venous thrombosis, acute renal failure, transfusion, prolonged length of stay, and nonroutine discharge irrespective of age, gender, race, and other medical comorbidities. Patients with a preexisting AUD are 2.7 times more likely to experience perioperative complications after shoulder arthroplasty.

Conclusion

Patients undergoing shoulder arthroplasty with a preexisting AUD have a greater likelihood of perioperative complications and health care resource utilization after shoulder arthroplasty. Presurgical alcohol screening may prove effective in identifying at-risk patients, and providing interventions before surgery may effectively limit the complication profile.

Level of evidence: [Level III](#), [Retrospective Cohort Design](#), [Treatment Study](#)

UPPER LIMB NEURAL TENSION

Double crush

J Foot Ankle Surg. 2014 Aug 14. pii: S1067-2516(14)00300-7. doi: 10.1053/j.jfas.2014.06.013.

Multiple Locations of Nerve Compression: An Unusual Cause of Persistent Lower Limb Paresthesia.

Ang CL¹, Foo LS².

- ¹Department of Orthopaedic Surgery, Singapore General Hospital, Singapore. Electronic address: med80199@yahoo.com.
- ²Department of Orthopaedic Surgery, Singapore General Hospital, Singapore.

Abstract

A paucity of appreciation exists that the "double crush" phenomenon can account for persistent leg symptoms even after spinal neural decompression surgery. We present an unusual case of multiple locations of nerve compression causing persistent lower limb paresthesia in a 40-year old male patient. The patient's lower limb paresthesia was persistent after an initial spinal surgery to treat spinal lateral recess stenosis thought to be responsible for the symptoms. It was later discovered that he had peroneal muscle herniations that had caused superficial peroneal nerve entrapments at 2 separate locations. The patient obtained much symptomatic relief after decompression of the peripheral nerve.

The "double crush" phenomenon and multiple levels of nerve compression should be considered when evaluating lower limb neurogenic symptoms, especially after spinal nerve root surgery.

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KEYWORDS: nerve compression syndrome; nerve root; paresthesia; peripheral nerve injury; peroneal neuropathy PMID: 25128915

KNEE

Landing patterns

Clin J Sport Med. 2014 Sep;24(5):373-9. doi: 10.1097/JSM.0000000000000053.

The impact of sex and knee injury history on jump-landing patterns in collegiate athletes: a clinical evaluation.

Lam KC¹, Valovich McLeod TC.

Abstract

OBJECTIVE:

To determine whether jump-landing patterns, as assessed by the Landing Error Scoring System (LESS), differ based on sex and knee injury history.

DESIGN:

Cross-sectional.

SETTING:

College.

PARTICIPANTS:

Two hundred fifteen intercollegiate athletes were grouped by sex (male = 116 and female = 99) and self-reported knee injury history (no = 148, mild = 31, and severe = 36).

INTERVENTIONS:

Participants performed 3 trials of a standardized jump-landing task that were videotaped and later scored using the LESS.

MAIN OUTCOME MEASURES:

Overall, individual item, sagittal total error, and frontal total error scores of the LESS.

RESULTS:

An interaction effect was reported for trunk flexion at initial ground contact. Main effects for sex indicated that males demonstrated more at-risk landing movement patterns on the sagittal plane (ie, limited trunk, knee and hip flexion at initial contact, and limited hip flexion throughout the landing), whereas females demonstrated more at-risk landing movement patterns on the frontal plane (ie, knee valgus at initial ground contact and maximum knee flexion, and more frontal plane movement throughout the landing). No main effects were reported for injury history.

CONCLUSIONS:

Jump-landing patterns seem to be impacted by sex but not knee injury history. Findings related to sex differences corroborate with previous laboratory-based investigations. Furthermore, findings support the clinical use of the LESS to screen for individuals who may be at risk for a lower extremity injury. Future studies should further investigate the clinical utility of the LESS, particularly its ability to predict lower extremity injuries.

PMID: 24284948

Arcuate ligament

Knee Surg Sports Traumatol Arthrosc. 2014 Sep;22(9):2121-2127. Epub 2013 Aug 31.

The arcuate ligament revisited: role of the posterolateral structures in providing static stability in the knee joint.

Thaunat M¹, Pioger C, Chatellard R, Conteduca J, Khaleel A, Sonnery-Cottet B.

Abstract

PURPOSE:

To determine the involvement of the posterolateral structures including the lateral collateral ligament, the popliteus muscle-tendon unit, the arcuate ligament (popliteofibular ligament, fabellofibular ligament, popliteomeniscal fascicles, capsular arm of short head of the biceps femoris and anterolateral ligament) and the posterior cruciate ligament in providing restraint to excessive recurvatum, tibial posterior translation and external tibial rotation at 90° of flexion.

METHODS:

Ten fresh-frozen cadaveric knees were tested with dial test, posterior drawer test and recurvatum test. The values were collected, using a surgical navigation system, on intact knees, following a serial section of the posterolateral corner (lateral collateral ligament, arcuate ligament and popliteus muscle-tendon unit), followed by the additional section of the posterior cruciate ligament.

RESULTS:

The mean tibial external rotation, recurvatum and posterior drawer were, respectively, measured at 9° ± 4°, 2° ± 3° and 9 ± 1 mm on intact knees. These values increase to 12° ± 5°, 3° ± 2° and 9 ± 1 mm after cutting the lateral collateral ligament; 17° ± 6° (p < 0.05), 3° ± 2° and 10 ± 1 mm after sectioning the arcuate ligament; 18° ± 7°, 3° ± 2° and 10 ± 1 mm after sectioning the popliteus muscle-tendon unit and 27° ± 6° (p < 0.05), 5° ± 3° (p < 0.05) and 28 ± 2 mm (p < 0.05) after the additional section of the posterior cruciate ligament.

CONCLUSION:

Among the different structures of the posterolateral corner, only the arcuate ligament has a significant role in restricting excessive primary and coupled external rotation. The popliteus muscle-tendon unit is not a primary static stabilizer to tibial external rotation at 90° of knee flexion. The posterior cruciate ligament is the primary restraint to excessive recurvatum and posterior tibial translation. The posterior cruciate ligament and the arcuate ligament have predominant role for the posterolateral stability of the knee. The functional restoration of these ligaments is an important part of the surgical treatment of posterolateral ligamentous injuries.

PMID: 23996070

Fatigue and mechanics

Knee Surg Sports Traumatol Arthrosc. 2014 Sep;22(9):2202-2208. Epub 2013 Sep 18.

Knee kinematics is altered post-fatigue while performing a crossover task.

Cortes N¹, Greska E, Ambegaonkar JP, Kollock RO, Caswell SV, Onate JA.

Author information

Abstract

PURPOSE:

To examine the effect of a sequential fatigue protocol on lower extremity biomechanics during a crossover cutting task in female soccer players.

METHODS:

Eighteen female collegiate soccer players alternated between a fatigue protocol and two consecutive unanticipated crossover trials until fatigue was reached. Lower extremity biomechanics were evaluated during the crossover using a 3D motion capture system and two force plates. Repeated-measures ANOVAs analysed differences between three sequential stages of fatigue (pre, 50, 100 %) for each dependent variable ($\alpha = 0.05$).

RESULTS:

Knee flexion angles at initial contact (IC) for pre ($-32 \pm 9^\circ$) and 50 % ($-29 \pm 11^\circ$) were significantly higher than at 100 % fatigue ($-22 \pm 9^\circ$) ($p < 0.001$ and $p = 0.015$, respectively). Knee adduction angles at IC for pre ($9 \pm 5^\circ$) and 50 % ($8 \pm 4^\circ$) were significantly higher ($p = 0.006$ and $p = 0.049$, respectively) than at 100 % fatigue ($6 \pm 4^\circ$).

CONCLUSIONS:

Fatigue altered sagittal and frontal knee kinematics after 50 % fatigue whereupon participants had diminished knee control at initial contact. Interventions should attempt to reduce the negative effects of fatigue on lower extremity biomechanics by promoting appropriate frontal plane alignment and increased knee flexion during fatigue status. LEVEL OF EVIDENCE: III.

PMID: 24045915

Meniscus

Motions

J Orthop Surg Res. 2014 Aug 21;9(1):65.

Assessment of tibial rotation and meniscal movement using kinematic magnetic resonance imaging.

Chen HN, Yang K, Dong QR, Wang Y.

Abstract

Objective This work aimed to assess tibial rotations, meniscal movements, and morphological changes during knee flexion and extension using kinematic magnetic resonance imaging (MRI).

Methods Thirty volunteers with healthy knees were examined using kinematic MRI. The knees were imaged in the transverse plane with flexion and extension angles from 0° to 40° and 40° to 0°, respectively. The tibial interior and exterior rotation angles were measured, and the meniscal movement range, height change, and side movements were detected.

Results The tibia rotated internally ($11.55^{\circ} \pm 3.20^{\circ}$) during knee flexion and rotated externally ($11.40^{\circ} \pm 3.0^{\circ}$) during knee extension. No significant differences were observed between the internal and external tibial rotation angles ($P_i > 0.05$), between males and females ($P_i > 0.05$), or between the left and right knee joints ($P_i > 0.05$). The tibial rotation angle with a flexion angle of 0° to 24° differed significantly from that with a flexion angle of 24° to 40° ($P_i < 0.01$). With knee flexion, the medial and lateral menisci moved backward and the height of the meniscus increased. The movement range was greater in the anterior horn than in the posterior horn and greater in the lateral meniscus than in the medial meniscus ($P_i < 0.01$). During backward movements of the menisci, the distance between the anterior and posterior horns decreased, with the decrease more apparent in the lateral meniscus ($P_i < 0.01$). The side movements of the medial and lateral menisci were not obvious, and a smaller movement range was found than that of the forward and backward movements.

Conclusion Knee flexion and extension facilitated internal and external tibial rotations, which may be related to the ligament and joint capsule structure and femoral condyle geometry.

PMID: 25142267

Knee/total**Manipulation timing**

J Bone Joint Surg Am. 2014 Aug 20;96(16):1349-57. doi: 10.2106/JBJS.M.00899.

The effect of timing of manipulation under anesthesia to improve range of motion and functional outcomes following total knee arthroplasty.

Issa K¹, Banerjee S², Kester MA³, Khanuja HS², Delanois RE², Mont MA².

Abstract**BACKGROUND:**

Manipulation under anesthesia has been reported to improve range of motion when other rehabilitative efforts fail to obtain adequate motion after total knee arthroplasty. The purpose of this study was to evaluate the effects of the timing of the manipulation on knee range of motion and clinical outcomes.

METHODS:

All 2128 total knee arthroplasties performed at our institution from 2005 to 2011 were reviewed to determine the number of patients who had undergone manipulation under anesthesia. A total of 144 manipulations in eighty-eight women and forty-five men were reviewed. Manipulations under anesthesia that were performed within the first twelve weeks after total knee arthroplasty were considered early and those after that period were considered late. Patients were further substratified according to the timing of the manipulation: Group I included those who had the manipulation within six weeks; Group II, at seven to twelve weeks; Group III, at thirteen to twenty-six weeks; and Group IV, after twenty-six weeks. Outcomes evaluated included gains in flexion and final range of motion, and Knee Society objective and function scores between early and late manipulation, using various adjusted multivariable regression models and at a mean follow-up of fifty-one months (range, twelve to eighty-one months). Mediation analysis was used to investigate whether gains in range of motion from the manipulations under anesthesia alone had mediated the effect between the timing of the manipulation and the clinical outcomes.

RESULTS:

Patients who underwent early manipulation had a significantly higher mean gain in flexion (36.5° versus 17°), higher final range of motion (119° versus 95°), and higher Knee Society objective (89 versus 84 points) and function scores (88 versus 83 points) than those who had late manipulation under anesthesia. There were no significant differences in the outcomes of Groups I and II. Manipulations after twenty-six weeks resulted in unsatisfactory clinical outcomes. Multivariable regression analyses confirmed significantly better clinical outcomes with early manipulation. Mediation analysis showed that the timing of manipulation independently had significantly contributed to the outcomes.

CONCLUSIONS:

Orthopaedic surgeons should have a low threshold for performing early manipulations with the patient under anesthesia within twelve weeks after an arthroplasty, to achieve higher knee range of motion and improved clinical outcomes.

LEVEL OF EVIDENCE: Therapeutic Level III. See Instructions for Authors for a complete description of levels of evidence. Copyright © 2014 by The Journal of Bone and Joint Surgery, Incorporated. PMID: 25143495

OSTEOARTHRITIS/KNEE

Impact of OA

Rheumatology (Oxford). 2014 Aug 23. pii: keu332.

Inadequate pain relief and large functional loss among patients with knee osteoarthritis: evidence from a prospective multinational longitudinal study of osteoarthritis real-world therapies.

Conaghan PG¹, Peloso PM², Everett SV², Rajagopalan S², Black CM², Mavros P², Arden NK², Phillips CJ², Rannou F², van de Laar MA², Moore RA², Taylor SD³.

Abstract

OBJECTIVE:

To estimate the prevalence of inadequate pain relief (IPR) among patients with symptomatic knee OA prescribed analgesic therapy and to characterize patients with IPR.

METHODS:

Patients ≥ 50 years old with physician-diagnosed knee OA who had taken topical or oral pain medication for at least 14 days were recruited for this prospective non-interventional study in six European countries. Pain and function were assessed using the Brief Pain Inventory (BPI) and the WOMAC; quality of life (QoL) was assessed using the 12-item short form. IPR was defined as an average pain score of >4 out of 10 on BPI question 5.

RESULTS:

Of 1187 patients enrolled, 68% were female and the mean age was 68 years (s.d. 9); 639 (54%) met the definition of IPR. Patient responses for the BPI average pain question were well correlated with responses on the WOMAC pain subscale (Spearman $r = 0.64$, $P < 0.001$). In multivariate logistic regression, patients with IPR had greater odds of being female [adjusted odds ratio (adjOR) 1.90 (95% CI 1.46, 2.48)] and having OA in both knees [adjOR 1.48 (95% CI 1.15, 1.90)], higher BMI, longer OA duration, depression or diabetes. Patients with IPR (vs non-IPR) were more likely to have worse QoL, greater function loss and greater pain interference.

CONCLUSION:

IPR is common among patients with knee OA requiring analgesics and is associated with large functional loss and impaired QoL. Patients at particular risk of IPR, as characterized in this study, may require greater attention towards their analgesic treatment options. Trial registration: <https://clinicaltrials.gov/> (NCT01294696).

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KEYWORDS: analgesic therapy; inadequate pain relief; knee; osteoarthritis PMID: 25150513

Altered foot function

The Knee DOI: <http://dx.doi.org/10.1016/j.knee.2014.08.004>

Altered dynamic foot kinematics in people with medial knee osteoarthritis during walking: a cross

Abstract

Background

Footwear and insoles are used to reduce knee load in people with medial knee osteoarthritis (OA), despite a limited understanding of foot function in this group. The aim of this study was to investigate the differences in foot kinematics between adults with and without medial knee OA during barefoot walking.

Methods

Foot kinematics were measured during walking in 30 adults; 15 with medial knee OA (mean age 67.0 standard deviation (SD) 8.9 years; height 1.66 SD 0.13 m; body mass 84.2 SD 15.8 kg; BMI 30.7 SD 6.2; K-L grade 3: 5, grade 4: 10) and 15 aged and gender matched control participants with 12 motion analysis cameras using the IOR multi-segment foot model. Motion of the knee joint, hindfoot, midfoot, forefoot and hallux were compared between groups using clustered linear regression.

Results

The knee OA group displayed reduced coronal plane range of motion of the midfoot (mean 3.8° vs. 5.4°, effect size = 1.1, $p = 0.023$), indicating reduced midfoot mobility. There was also a reduced sagittal plane range of motion at the hallux in the knee OA group compared to the control group (mean 29.6° vs. 36.3°, effect size = 1.2, $p = 0.008$).

No statistically significant differences in hindfoot or forefoot motion were observed.

Conclusions

People with medial knee OA display altered foot function compared to healthy controls. As foot and knee function are related, it is possible that altered foot function in people with knee OA may influence the effects of footwear and insoles.

Keywords:

gait analysis, biomechanics, rehabilitation, knee, osteoarthritis, foot

ANKLE/INSTABILITY**In young adults**

J Foot Ankle Surg. 2014 Aug 16. pii: S1067-2516(14)00249-X. doi: 10.1053/j.jfas.2014.06.001.

A Large-scale Study on Epidemiology and Risk Factors for Chronic Ankle Instability in Young Adults.

Hershkovich O¹, Tenenbaum S², Gordon B³, Bruck N⁴, Thein R⁴, Derazne E³, Tzur D⁵, Shamiss A⁶, Afek A⁷.

Abstract

Up to 40% of ankle sprains can result in chronic ankle instability (CAI). The prevalence of CAI and its association with body mass index (BMI) and height in the general young adult population has not been reported. The database records of young adults before recruitment into mandatory military service were studied. Information on the disability codes associated with CAI was retrieved. Logistic regression models were used to assess the association between the BMI and body height with various grades of CAI severity. The study cohort included 829,791 subjects (470,125 males and 359,666 females). The prevalence was 0.7% for mild CAI and 0.4% for severe instability in males and 0.3% and 0.4%, respectively, for females ($p < .001$). An increased BMI was associated with ankle instability in males (overweight, odds ratio [OR] 1.249, $p < .001$; obese, OR 1.418, $p < .001$) and females (overweight, OR 1.989 $p < .001$; obese, OR 2.754, $p < .001$). The body height was associated with an increased risk of CAI when the highest height quintile was compared with the lowest height quintile in both males (OR 2.443, $p < .001$) and females (OR 1.436, $p < .001$) for all levels of instability severity.

The present study has shown a greater prevalence of CAI among males than females in a general healthy young adult population. CAI was associated with an increased BMI and greater body height for all grades of instability severity.

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KEYWORDS: ankle sprain; body mass index; calcaneus; fibula; height; ligament; talus; weight
PMID: 25135102

MANUAL THERAPY

LBP and McKenzie

J Back Musculoskelet Rehabil. 2014 Aug 26.

A comparison of mckenzie therapy with electrophysical agents for the treatment of work related low back pain: A randomized controlled trial.

Murtezani A¹, Govori V², Meka VS¹, Ibraimi Z³, Rrecaj S¹, Gashi S⁴.

Abstract

BACKGROUND AND OBJECTIVE:

Chronic low back pain (LBP) is a major public health problem in industrialized countries and is one of the most common reasons for seeking healthcare. Although the McKenzie therapy is widely used for the treatment of low back pain, there is evidence for no improvement with exercise in short-, intermediate-, or long-term outcomes of pain relief or function. The aim of this study was to compare the effect of the McKenzie therapy with electrophysical agents (EPAs) in patients with chronic LBP. MATERIAL AND METHOD: A randomized controlled comparative trial with a 3-month follow-up period was conducted between January 2009 and June 2012. 271 patients with chronic LBP, (more than three months duration of symptoms) were randomized into two groups: the McKenzie therapy group (n=134), and electrophysical agents group, (n=137). The treatment period of both groups was 4 weeks at an outpatient clinic. Clinical outcomes (pain intensity, trunk flexion range of motion, and disability) were obtained at follow-up appointments at the end of the treatment period, 2 and 3 months. RESULTS: Significant improvement of spinal motion, reduction of pain and disability were demonstrated in both groups but the results show the greater improvement in the McKenzie group ($p < 0.05$).

CONCLUSION:

McKenzie therapy reduces pain, and disability, among subjects with chronic LBP. This study revealed that the McKenzie therapy is more effective than EPAs group.

KEYWORDS: Low back pain; McKenzie therapy; electrophysical agents; randomized controlled trial PMID: 25159291

Manipulation and LBP

Spine J. 2014 Jul 1;14(7):1106-16. doi: 10.1016/j.spinee.2013.07.468. Epub 2013 Oct 16.

Dose-response and efficacy of spinal manipulation for care of chronic low back pain: a randomized controlled trial.

Haas M¹, Vavrek D², Peterson D³, Polissar N⁴, Neradilek MB⁴.

Abstract

BACKGROUND CONTEXT:

There have been no full-scale trials of the optimal number of visits for the care of any condition with spinal manipulation.

PURPOSE:

To identify the dose-response relationship between visits to a chiropractor for spinal manipulation and chronic low back pain (cLBP) outcomes and to determine the efficacy of manipulation by comparison with a light massage control.

STUDY DESIGN/SETTING:

Practice-based randomized controlled trial.

PATIENT SAMPLE:

Four hundred participants with cLBP.

OUTCOME MEASURES:

The primary cLBP outcomes were the 100-point modified Von Korff pain intensity and functional disability scales evaluated at the 12- and 24-week primary end points. Secondary outcomes included days with pain and functional disability, pain unpleasantness, global perceived improvement, medication use, and general health status.

METHODS:

One hundred participants with cLBP were randomized to each of four dose levels of care: 0, 6, 12, or 18 sessions of spinal manipulation from a chiropractor. Participants were treated three times per week for 6 weeks. At sessions when manipulation was not assigned, they received a focused light massage control. Covariate-adjusted linear dose effects and comparisons with the no-manipulation control group were evaluated at 6, 12, 18, 24, 39, and 52 weeks.

RESULTS:

For the primary outcomes, mean pain and disability improvement in the manipulation groups were 20 points by 12 weeks and sustainable to 52 weeks. Linear dose-response effects were small, reaching about two points per six manipulation sessions at 12 and 52 weeks for both variables ($p < .025$). At 12 weeks, the greatest differences from the no-manipulation control were found for 12 sessions (8.6 pain and 7.6 disability points, $p < .025$); at 24 weeks, differences were negligible; and at 52 weeks, the greatest group differences were seen for 18 visits (5.9 pain and 8.8 disability points, $p < .025$).

CONCLUSIONS:

The number of spinal manipulation visits had modest effects on cLBP outcomes above those of 18 hands-on visits to a chiropractor. Overall, 12 visits yielded the most favorable results but was not well distinguished from other dose levels.

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KEYWORDS: Chiropractic; Chronic low back pain; Dose-response; Randomized controlled trial; Spinal manipulation PMID: 24139233

Muscles

Hamstring tears

Br J Sports Med. 2014 Sep;48(18):1358-63. doi: 10.1136/bjsports-2014-093860. Epub 2014 Jul 18.

Predicting return to play after hamstring injuries.

Moën MH¹, Reurink G², Weir A³, Tol JL³, Maas M⁴, Goudswaard GJ³.

Abstract

BACKGROUND:

Previous studies on the prognostic value of clinical and MRI parameters for the time to return to play (TTRTP) in acute hamstring injuries showed only limited to moderate evidence for the various investigated parameters. Some studies had multiple methodological limitations, including retrospective designs and the use of univariate analysis only. The aim of this study was to assess the prognostic value of clinical and MRI parameters for TTRTP using multivariate analysis.

METHODS:

28 clinical and MRI parameters were prospectively investigated for an association with TTRTP in 80 non-professional athletes with MRI positive hamstring injuries undergoing a standardised rehabilitation programme. The association between possible prognostic parameters and TTRTP was assessed with a multivariate linear regression model. Parameters that had a p value <0.2 on univariate testing were included in this model.

RESULTS:

74 athletes were available for analysis. A total of nine variables met the criteria for the multivariate analysis: intensity of sports, level of sports, self-predicted TTRTP by the athlete, length of discomfort on palpation, deficit in passive straight leg raise, pain score on isometric knee flexion, isometric knee flexion strength deficit and distance of the proximal pole of the MRI hyperintensity to the tuber ischiadicum. Of these, only self-predicted TTRTP by the athlete and a passive straight leg raise deficit remained significantly associated with TTRTP after stepwise logistic regression.

CONCLUSIONS:

The clinical parameters self-predicted TTRTP and passive straight leg raise deficit are independently associated with the TTRTP. MRI parameters in grade 1 and 2 hamstring injuries, as described in the literature, are not associated with TTRTP. For clinical practice, prognosis of the TTRTP in these injuries should better be based on clinical parameters.

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KEYWORDS: Hamstring; MRI; Muscle damage/injuries; Soft tissue PMID: 25037199

MRI and hanstrings

Br J Sports Med. 2014 Sep;48(18):1370-6. doi: 10.1136/bjsports-2013-092450. Epub 2013 Nov 19.

MRI observations at return to play of clinically recovered hamstring injuries.

Reurink G¹, Goudswaard GJ², Tol JL², Almusa E³, Moen MH⁴, Weir A², Verhaar JA⁵, Hamilton B⁶, Maas M⁷.

Abstract**BACKGROUND:**

Previous studies have shown that MRI of fresh hamstring injuries have diagnostic and prognostic value. The clinical relevance of MRI at return to play (RTP) has not been clarified yet. The aim of this study is to describe MRI findings of clinically recovered hamstring injuries in amateur, elite and professional athletes that were cleared for RTP.

METHODS:

We obtained MRI of 53 consecutive athletes with hamstring injuries within 5 days of injury and within 3 days of RTP. We assessed the following parameters: injured muscle, grading of injury, presence and extent of intramuscular signal abnormality. We recorded reinjuries within 2 months of RTP.

RESULTS:

MRIs of the initial injury showed 27 (51%) grade 1 and 26 (49%) grade 2 injuries. Median time to RTP was 28 days (range 12-76). On MRI at RTP 47 athletes (89%) had intramuscular increased signal intensity on fluid-sensitive sequences with a mean longitudinal length of 77 mm (± 53) and a median cross-sectional area of 8% (range 0-90%) of the total muscle area. In 22 athletes (42%) there was abnormal intramuscular low-signal intensity. We recorded five reinjuries.

CONCLUSIONS:

89% of the clinically recovered hamstring injuries showed intramuscular increased signal intensity on fluid-sensitive sequences on MRI. Normalisation of this increased signal intensity seems not required for a successful RTP. Low-signal intensity suggestive of newly developed fibrous tissues is observed in one-third of the clinically recovered hamstring injuries on MRI at RTP, but its clinical relevance and possible association with increased reinjury risk is Br J Sports Med. 2014 Sep;48(18):1347-51. doi: 10.1136/bjsports-2013-093302. Epub 2014 Jul 16.

Grading muscle tears

British athletics muscle injury classification: a new grading system.

Pollock N¹, James SL², Lee JC³, Chakraverty R⁴.

Abstract

The commonly used muscle injury grading systems based on three grades of injury, representing minor, moderate and complete injuries to the muscle, are lacking in diagnostic accuracy and provide limited prognostic information to the clinician. In recent years, there have been a number of proposals for alternative grading systems. While there is recent evidence regarding the prognostic features of muscle injuries, this evidence has not often been incorporated into the grading proposals. The British Athletics Muscle Injury Classification proposes a new system, based on the available evidence, which should provide a sound diagnostic base for therapeutic decision-making and prognostication. Injuries are graded 0-4 based on MRI features, with Grades 1-4 including an additional suffix 'a', 'b' or 'c' if the injury is 'myofascial', 'musculo-tendinous' or 'intratendinous'. Retrospective and prospective studies in elite track and field athletes are underway to validate the classification for use in hamstring muscle injury management. It is intended that this grading system can provide a suitable diagnostic framework for enhanced clinical decision-making in the management of muscle injuries and assist with future research to inform the development of improved prevention and management strategies.

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KEYWORDS: Hamstring; MRI; Muscle damage/injuries; Sporting injuries PMID: 25031367

[Return to play](#)

Br J Sports Med. 2014 Sep;48(18):1364-9. doi: 10.1136/bjsports-2013-093016. Epub 2014 Feb 3.

At return to play following hamstring injury the majority of professional football players have residual isokinetic deficits.

Tol JL¹, Hamilton B², Eirale C¹, Muxart P¹, Jacobsen P¹, Whiteley R¹.

Abstract

BACKGROUND:

There is an ongoing debate regarding the optimal criteria for return to sport after an acute hamstring injury. Less than 10% isokinetic strength deficit is generally recommended but this has never been documented in professional football players after rehabilitation. Our aim was to evaluate isokinetic measurements in MRI-positive hamstring injuries.

METHODS:

Isokinetic measurements of professional football players were obtained after completing a standardised rehabilitation programme. An isokinetic strength deficit of more than 10% compared with the contralateral site was considered abnormal. Reinjuries within 2 months were recorded.

RESULTS:

52 players had a complete set of isokinetic testing before clinical discharge. There were 27 (52%) grade 1 and 25 (48%) grade 2 injuries. 35 of 52 players (67%) had at least one of the three hamstring-related isokinetic parameters that display a deficit of more than 10%. The percentage of players with 10% deficit for hamstring concentric 60°/s, 300°/s and hamstring eccentric was respectively 39%, 29% and 28%. There was no significant difference of mean isokinetic peak torques and 10% isokinetic deficits in players without reinjury (N=46) compared with players with reinjury (N=6).

CONCLUSIONS:

When compared with the uninjured leg, 67% of the clinically recovered hamstring injuries showed at least one hamstring isokinetic testing deficit of more than 10%. Normalisation of isokinetic strength seems not to be a necessary result of the successful completion of a football-specific rehabilitation programme. The possible association between isokinetic strength deficit and increased reinjury risk remains unknown.

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KEYWORDS: Hamstring injuries; Isokinetics; Soccer PMID: 2449366

Exercise

Time based/weight loss

Med Sci Sports Exerc. 2014 Aug 25.

Time-Based Physical Activity Interventions for Weight Loss: A Randomized Trial.

Jakicic JM¹, Rickman AD, Lang W, Davis KK, Gibbs BB, Neiberg R, Marcus MD.

Abstract

PURPOSE:

To examine whether enhancing standard behavior weight loss interventions (SBWP) with additional strategies at the initiation of the intervention (ADOPT) or providing the additional strategies at predetermined times over the intervention period (MAINTAIN) enhances 18 month weight loss.

METHODS:

This was a clinical trial with participants (n=195; age= 43.2±8.6 yrs; BMI= 33.0±3.4 kg/m) randomized to SBWP, ADOPT, or MAINTAIN. All were prescribed an energy restricted diet and physical activity, with group intervention sessions delivered over 18 months. ADOPT received additional phone contact (months 1-3), supervised exercise (months 1-6), and behavior campaigns (months 4-9). MAINTAIN received additional phone contact (months 4-6), supervised exercise (months 7-12), and behavior campaigns (months 13-18).

RESULTS:

There was a significant Group X Time interaction for weight loss (p=0.0032). SBWP lost 9.3±0.9, 7.8±1.1, and 5.9±1.2 kg at 6, 12, and 18 months, respectively. ADOPT lost 8.9±0.9, 7.6±1.2, and 5.8±1.2 kg, and MAINTAIN lost 9.7±0.9, 11.0±1.2, and 9.0±1.2 kg at 6, 12, and 18 months, respectively. The Group X Time interaction for SBWP vs. MAINTAIN (p=0.0033) and ADOPT vs. MAINTAIN (p=0.0075) was significant. There was a significant Group X Time interaction for change in fitness (p=0.0060). The Group X Time interaction for MAINTAIN vs. ADOPT (p=0.0018) was significant with a trend for MAINTAIN vs. SBWP (p=0.0525).

CONCLUSIONS:

MAINTAIN improved 18-month weight loss compared to SBWP and ADOPT, with statistical trends that MAINTAIN resulted in greater improvements in fitness. These results suggest that time-based strategies emphasizing physical activity conferred greater benefits when delivered later and over the full course of intervention. This provides valuable information for the implementation of time-based strategies to improve long-term weight loss and fitness in overweight and obese adults.

PMID: 25160843

Conditioning in youth

Sports Med. 2014 Sep;44(9):1209-23. doi: 10.1007/s40279-014-0196-4.

The health benefits of muscular fitness for children and adolescents: a systematic review and meta-analysis.

Smith JJ¹, Eather N, Morgan PJ, Plotnikoff RC, Faigenbaum AD, Lubans DR.

Abstract**BACKGROUND:**

Physical fitness during childhood and adolescence has been identified as an important determinant of current and future health status. While research has traditionally focused on the association between cardio-respiratory fitness and health outcomes, the association between muscular fitness (MF) and health status has recently received increased attention.

OBJECTIVE:

The aim of this systematic review and meta-analysis was to evaluate the potential physiological and psychological benefits associated with MF among children and adolescents.

METHODS:

A systematic search of six electronic databases (PubMed, SPORTDiscus, Scopus, EMBASE, PsycINFO and OVID MEDLINE) was performed on the 20th May, 2013. Cross-sectional, longitudinal and experimental studies that quantitatively examined the association between MF and potential health benefits among children and adolescents were included. The search yielded 110 eligible studies, encompassing six health outcomes (i.e., adiposity, bone health, cardiovascular disease [CVD] and metabolic risk factors, musculoskeletal pain, psychological health and cognitive ability). The percentage of studies reporting statistically significant associations between MF and the outcome of interest was used to determine the strength of the evidence for an association and additional coding was conducted to account for risk of bias. Meta-analyses were also performed to determine the pooled effect size if there were at least three studies providing standardised coefficients.

RESULTS:

Strong evidence was found for an inverse association between MF and total and central adiposity, and CVD and metabolic risk factors. The pooled effect size for the relationship between MF and adiposity was $r = -0.25$ (95 % CI -0.41 to -0.08). Strong evidence was also found for a positive association between MF and bone health and self-esteem. The pooled effect size for the relationship between MF and perceived sports competence was $r = 0.39$ (95 % CI 0.34-0.45). The evidence for an association between MF and musculoskeletal pain and cognitive ability was inconsistent/uncertain. Where evidence of an association was found, the associations were generally low to moderate.

CONCLUSION:

The findings of this review highlight the importance of developing MF in youth for a number of health-related benefits.

PMID: 24788950

Core

Whiplash and multifidus response

Spine J. 2014 Aug 7. pii: S1529-9430(14)00778-5. doi: 10.1016/j.spinee.2014.08.002.

Loud pre-impact tones reduce the cervical multifidus muscle response during rear-end collisions: A potential method for reducing whiplash injuries.

Mang DW¹, Siegmund GP², Brown HJ¹, Goonetilleke SC¹, Blouin JS³.

Abstract

BACKGROUND CONTEXT: Neck muscle responses following unexpected rear-end collisions consist of a stereotypical combination of postural and startle responses. Prior work using surface electromyography has shown that the superficial neck muscle responses can be attenuated when a loud tone (105dB) is presented 250ms prior to impact, but the accompanying response of the deeper multifidus muscles remains unknown. Quantifying this response in multifidus is important because this muscle attaches directly to the cervical facet capsule and can potentially increase the strain in the capsule during an impact and contribute to whiplash injury.

PURPOSE: This study will investigate if a loud pre-impact tone decreases the cervical multifidus muscle response during rear-end perturbations.

STUDY DESIGN: Following approval by the University's Clinical Ethics Review Board, human volunteers experienced a series of three whiplash-like perturbations.

PATIENT SAMPLE: Twelve subjects with no history of neurological disorders or whiplash injury were recruited to participate in this experiment.

OUTCOME MEASURES:

Bilateral indwelling electromyography of multifidus at the C4 and C6 levels, surface electromyography of sternocleidomastoid and C4 paraspinals, and kinematics of the head/neck were measured.

METHODS:

Subjects experienced three whiplash-like perturbations (peak acceleration of 19.5m/s^2) preceded by either no tone or a loud tone (105dB) presented 250ms before sled acceleration onset. This study was supported by unrestricted grants from multiple national funding agencies with no potential conflicts of interest.

RESULTS:

The loud tone decreased muscle activity of C6 multifidus (42%) and C4 paraspinals (30%), but did not affect C4 multifidus or sternocleidomastoid activity. Peak head kinematic responses (extension angle: 6%, retraction: 9%, linear forward acceleration: 9%, and angular acceleration in extension: 13%) were also decreased by the loud pre-impact tone.

CONCLUSIONS:

The attenuation of peak C6 multifidus activity and head kinematic responses suggests that a loud pre-impact tone may reduce the strain in the cervical facet capsule, which may reduce the risk of whiplash injury during rear-end collisions.

Copyright © 2014 Elsevier Inc. All rights reserved. **KEYWORDS:** Neck muscles; head-neck control; neuromuscular response; perturbation; pre-stimulus inhibition; whiplash PMID: 25110275

Posture

Pain and posture

Pain communication through body posture: The development and validation of a stimulus set

Pain, 08/28/2014 Clinical Article

Walsh J, et al

Summary

This study reports the creation and validation of a stimulus set of affective body postures which includes pain.

Abstract

Pain can be communicated non-verbally through facial expressions, vocalisations, and bodily movements. Most studies have focussed on the facial display of pain but there is little research on postural display. Stimulus sets for facial and vocal expressions of pain have been developed, but there is no equivalent for body-based expressions. Reported here is the development of a new stimulus set of dynamic body postures that communicate pain and basic emotions. This stimulus set is designed to facilitate research into the bodily communication of pain.

We report a three-phase development and validation study. First 16 actors performed affective body postures for pain, as well as happiness, sadness, fear, disgust, surprise, anger, and neutral expressions. Second, 20 observers independently selected the best image stimuli based on the accuracy of emotion identification and valence/arousal ratings. Third, to establish reliability, this accuracy and valence rating procedure was repeated with a second independent group of 40 participants.

A final set of 144 images with good reliability was established and is made available. Results demonstrate that pain, along with basic emotions, can be communicated through body posture. Cluster analysis demonstrates pain and emotion are recognised with a high degree of specificity. Additionally, pain was rated as the most unpleasant (negative valence) of the expressions, and was associated with a high level of arousal. For the first time, specific postures communicating pain are described. The stimulus set is provided as a tool to facilitate the study of non-verbal pain communication, and its possible uses are discussed.

Keywords: Pain, Communication, Body posture, Nonverbal behaviour

ATHLETICS

Youth football and concussion

Clin J Sport Med. 2014 Sep;24(5):416-21. doi: 10.1097/JSM.0000000000000055.

Head impact exposure in youth football: elementary school ages 7-8 years and the effect of returning players.

Young TJ¹, Daniel RW, Rowson S, Duma SM.

Abstract

OBJECTIVE:

To provide data describing the head impact exposure of 7- to 8-year-old football players.

DESIGN:

Head impact data were collected from 19 players over the course of 2 seasons using helmet-mounted accelerometer arrays.

SETTING:

Data were collected from 2 youth football teams in Blacksburg, VA, spanning 2 seasons.

PARTICIPANTS:

A total of 19 youth football players aged 7-8 years.

INDEPENDENT VARIABLES:

Type of session (practice or game) and the player's experience.

MAIN OUTCOME MEASURES:

Head impact frequency, acceleration magnitude, and impact location for games, practices, and the season as a whole were measured.

RESULTS:

The average instrumented player sustained 9 ± 6 impacts per practice, 11 ± 11 impacts per game, and 161 ± 111 impacts per season. The average instrumented player had a median impact of 16 ± 2 g and 686 ± 169 rad/s and a 95th percentile impact of 38 ± 13 g and 2052 ± 664 rad/s throughout a season. Impacts of 40 g or greater tended to occur more frequently in practices than in games, and practices had a significantly higher 95th percentile impact magnitude than games ($P = 0.023$). Returning players had significantly more impacts than first time players ($P = 0.007$).

CONCLUSIONS:

These data are a further step toward developing effective strategies to reduce the incidence of concussion in youth football and have applications toward youth-specific football helmet designs.

PMID: 24326933

Ballet dancers and nutrition

Clin J Sport Med. 2014 Sep;24(5):390-6. doi: 10.1097/JSM.0000000000000054.

Body mass index, nutritional knowledge, and eating behaviors in elite student and professional ballet dancers.

Wyon MA¹, Hutchings KM, Wells A, Nevill AM.

Abstract

OBJECTIVE:

It is recognized that there is a high esthetic demand in ballet, and this has implications on dancers' body mass index (BMI) and eating behaviors. The objective of this study was to examine the association between BMI, eating attitudes, and nutritional knowledge of elite student and professional ballet dancers.

DESIGN:

Observational design.

SETTING:

Institutional.

PARTICIPANTS:

One hundred eighty-nine participants from an elite full-time dance school (M = 53, F = 86) and from an elite ballet company (M = 16, F = 25) volunteered for the study. There were no exclusion criteria.

INTERVENTIONS:

Anthropometric data (height and mass), General Nutrition Knowledge Questionnaire (GNKQ), and the Eating Attitude Test-26 (EAT-26) were collected from each participant.

MAIN OUTCOME MEASURES:

Univariate analysis of variance was used to examine differences in gender and group for BMI, GNKQ, and EAT-26. Regression analyses were applied to examine interactions between BMI, GNKQ, and EAT-26.

RESULTS:

Professional dancers had significantly greater BMI than student dancers ($P < 0.001$), and males had significantly higher BMI scores than females ($P < 0.05$). Food knowledge increased with age ($P < 0.001$) with no gender difference. Student dancers had a significant interaction between year group and gender because of significantly higher EAT-26 scores for females in years 10 and 12. Regression analysis of the subcategories (gender and group) reported a number of significant relationships between BMI, GNKQ, and EAT-26.

CONCLUSIONS:

The findings suggest that dancers with disordered eating also display lower levels of nutritional knowledge, and this may have an impact on BMI. Female students' eating attitudes and BMI should especially be monitored during periods of adolescent development.

PMID: 24326932

Longevity of elite athletes

Mayo Clin Proc. 2014 Aug 6. pii: S0025-6196(14)00519-9. doi: 10.1016/j.mayocp.2014.06.004.

Elite Athletes Live Longer Than the General Population: A Meta-Analysis.

Garatachea N¹, Santos-Lozano A², Sanchis-Gomar F³, Fiuza-Luces C⁴, Pareja-Galeano H³, Emanuele E⁵, Lucia A⁶.

Abstract**OBJECTIVE:**

To perform a meta-analysis of cohort studies aimed at providing an accurate overview of mortality in elite athletes.

PATIENTS AND METHODS:

We reviewed English-language scientific articles available in Medline and Web of Science databases following the recommendations of the Meta-analyses Of Observational Studies in Epidemiology group. We searched for publications on longevity and professional or elite athletes (with no restriction on the starting date and up to March 31, 2014).

RESULTS:

Ten studies, including data from a total of 42,807 athletes (707 women), met all inclusion criteria. The all-cause pooled standard mortality ratio (SMR) was 0.67 (95% CI, 0.55-0.81; $P < .001$) with no evidence of publication bias ($P = .24$) but with significant heterogeneity among studies ($I^2 = 96\%$; $Q = 224.46$; $P < .001$). Six studies provided data on cardiovascular disease (CVD) and 5 on cancer (in a total of 35,920 and 12,119 athletes, respectively). When only CVD was considered as a cause of mortality, the pooled SMR was 0.73 (95% CI, 0.65-0.82; $P < .001$) with no evidence of bias ($P = .68$) or heterogeneity among studies ($I^2 = 38\%$; $Q = 8.07$; $P = .15$). The SMR for cancer was 0.60 (95% CI, 0.38-0.94; $P = .03$) with no evidence of bias ($P = .20$) despite a significant heterogeneity ($I^2 = 91\%$; $Q = 44.21$; $P < .001$).

CONCLUSION:

The evidence available indicates that top-level athletes live longer than the general population and have a lower risk of 2 major causes of mortality, namely, CVD and cancer.

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PMID: 25128074

PAIN**Pain and empathy**

J Pain. 2014 Jun 19. pii: S1526-5900(14)00777-9. doi: 10.1016/j.jpain.2014.06.004.

Partners' Empathy Increases Pain Ratings: Effects of Perceived Empathy and Attachment Style on Pain Report and Display.

Hurter S¹, Paloyelis Y², de C Williams AC¹, Fotopoulou A³.

Abstract

Pain can be influenced by its social context. We aimed to examine under controlled experimental conditions how empathy from a partner and personal attachment style affect pain report, tolerance and facial expressions of pain. Fifty-four participants, divided into secure, anxious and avoidant attachment style groups, underwent a coldpressor task with their partners present. We manipulated how much empathy the participants perceived their partners had for them. We observed a significant main effect of perceived empathy on pain report, with greater pain reported in the high perceived empathy condition. No such effects were found for pain tolerance or facial display. We also found a significant interaction of empathy with attachment style group, with the avoidant group reporting and displaying less pain than the secure and the anxious groups in the high perceived empathy condition. No such findings were observed in the low empathy condition. These results suggest that empathy from one's partner may influence pain report, beyond behavioural reactions. In addition, the amount of pain report and expression people show in high empathy conditions depends on their attachment style.

PERSPECTIVE:

Believing that one's partner feels high empathy for one's pain may lead individuals to rate the intensity of pain as higher. Individual differences in attachment style moderate this empathy effect.

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KEYWORDS: attachment; empathy; partner; social presence; social support PMID: 24953886

White matter involvement

J Pain. 2014 Aug 15. pii: S1526-5900(14)00855-4. doi: 10.1016/j.jpain.2014.08.002.

White matter involvement in chronic musculoskeletal pain.

Lieberman G¹, Shpaner M¹, Watts R², Andrews T³, Filippi CG⁴, Davis M¹, Naylor MR⁵.

Abstract

There is emerging evidence that chronic musculoskeletal pain is associated with anatomical and functional abnormalities in gray matter. However, little research has investigated the relationship between chronic musculoskeletal pain and white matter (WM). In this study, we used whole-brain tract-based spatial statistics, and region-of-interest analyses of diffusion tensor imaging (DTI) data to demonstrate that patients with chronic musculoskeletal pain exhibit several abnormal WM integrity as compared to healthy controls. Chronic musculoskeletal pain was associated with lower fractional anisotropy (FA) in the splenium of corpus callosum, and left cingulum adjacent to the hippocampus. Patients also had higher radial diffusivity (RD) in the splenium, right anterior and posterior limbs of internal capsule, external capsule, superior longitudinal fasciculus, and cerebral peduncle. Patterns of axial diffusivity (AD) varied: patients exhibited lower AD in the left cingulum adjacent to the hippocampus and higher AD in the anterior limbs of internal capsule, and in the right cerebral peduncle. Several correlations between diffusion metrics and clinical variables were also significant at a $p < 0.01$ level: FA in the left uncinata fasciculus correlated positively with Total Pain Experience and typical levels of pain severity. AD in the left anterior limb of internal capsule and left uncinata fasciculus were correlated with Total Pain Experience and typical pain level. Positive correlations were also found between AD in the right uncinata and both Total Pain Experience and Pain Catastrophizing. These results demonstrate that WM abnormalities play a role in chronic musculoskeletal pain; either as a cause, predisposing factor, consequence, or compensatory adaptation.

PERSPECTIVE:

This article demonstrates that patients with chronic musculoskeletal pain exhibit altered metrics of diffusion in the brain's white matter as compared to healthy volunteers and that some of these differences are directly related to symptom severity.

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KEYWORDS: Chronic Pain; DTI; Neuroimaging; White Matter PMID: 25135468

Exercise sleep in RA

J Rheumatol. 2014 Aug 15. pii: jrheum.131282.

The Effect of Exercise on Sleep and Fatigue in Rheumatoid Arthritis: A Randomized Controlled Study.

Durcan L, Wilson E, Cunnane G.

Abstract

OBJECTIVE:

Sleep disturbance and chronic fatigue are common in rheumatoid arthritis (RA) and contribute to disability, symptomatology, and healthcare use. It has long been recognized in other populations that exercise can improve sleep and diminish fatigue. The effect of exercise on sleep quality and fatigue in RA has not been evaluated.

METHODS:

Ours is a randomized controlled study in RA to determine the effect of an exercise program on sleep quality and fatigue. These were measured using the Pittsburgh Sleep Quality Index and the Fatigue Severity Scale. Patients were randomized to either a 12-week, home-based exercise intervention or usual care. The exercise program consisted of specific exercises to target individual deficiencies identified using the Health Assessment Questionnaire (HAQ) with cardiovascular work as per the guidelines. The intervention group was evaluated on a 3-week basis. Full evaluation was carried out at baseline and at 12 weeks.

RESULTS:

Forty patients were randomized to the intervention with 38 controls. In the exercise intervention group, there was a statistically significant improvement in HAQ ($p = 0.00$), pain ($p = 0.05$), stiffness ($p = 0.05$), sleep quality ($p = 0.04$), and fatigue ($p = 0.04$). In our control group, there was a statistically significant improvement demonstrated in their overall perceptions of the benefits of exercise, but none of the other variables.

CONCLUSION:

Our study demonstrates that an exercise program resulted in significant improvement in sleep quality and fatigue. This is particularly interesting given the importance of fatigue as an outcome measure in RA and gives us yet another reason to prescribe exercise in this population.

PMID: 25128510

Tactile acuity

J Pain. 2014 Jun 28. pii: S1526-5900(14)00792-5. doi: 10.1016/j.jpain.2014.06.009.

Is Tactile Acuity Altered in People With Chronic Pain? A Systematic Review and Meta-analysis.

Catley MJ¹, O'Connell NE², Berryman C¹, Ayhan FF³, Moseley GL⁴.

Abstract

Impaired tactile acuity in people with chronic pain conditions has been suggested to reflect altered cortical representation of the painful body part, and treatments that aim to improve tactile acuity in these conditions have shown clinical benefit. Whether abnormalities in tactile acuity are a consistent feature of chronic pain remains largely unknown. The aim of this review was to systematically evaluate the literature and use meta-analysis to establish whether tactile acuity is altered in people with chronic non-neuropathic pain. We systematically searched the literature for studies that investigated tactile acuity in people with chronic non-neuropathic pain and compared it to an appropriate control group. Sixteen studies, reporting data from 5 chronic pain conditions, were included. Data were available for 18 chronic pain populations (n = 484) and 15 control populations (n = 378). Our results suggest that tactile acuity is diminished in arthritis, complex regional pain syndrome, and chronic low back pain but not in burning mouth syndrome. The strength of the available evidence is weakened by somewhat inconsistent results and the high risk of bias observed in all of the included studies.

PERSPECTIVE:

This systematic review synthesizes the evidence for tactile acuity deficits in people with chronic non-neuropathic pain. The findings suggest that tactile acuity deficits may be characteristic of chronic pain. That tactile acuity training may be of benefit to chronic pain disorders suggests that clinical trials of this possibility appear warranted.

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KEYWORDS: 2-point discrimination; Tactile acuity; chronic pain; reorganization; sensory training PMID: 24983492

Pain and functional loss

Rheumatology (Oxford). 2014 Aug 23. pii: keu332.

Inadequate pain relief and large functional loss among patients with knee osteoarthritis: evidence from a prospective multinational longitudinal study of osteoarthritis real-world therapies.

Conaghan PG¹, Peloso PM², Everett SV², Rajagopalan S², Black CM², Mavros P², Arden NK², Phillips CJ², Rannou F², van de Laar MA², Moore RA², Taylor SD³.

Abstract

OBJECTIVE:

To estimate the prevalence of inadequate pain relief (IPR) among patients with symptomatic knee OA prescribed analgesic therapy and to characterize patients with IPR.

METHODS:

Patients ≥ 50 years old with physician-diagnosed knee OA who had taken topical or oral pain medication for at least 14 days were recruited for this prospective non-interventional study in six European countries. Pain and function were assessed using the Brief Pain Inventory (BPI) and the WOMAC; quality of life (QoL) was assessed using the 12-item short form. IPR was defined as an average pain score of >4 out of 10 on BPI question 5.

RESULTS:

Of 1187 patients enrolled, 68% were female and the mean age was 68 years (s.d. 9); 639 (54%) met the definition of IPR. Patient responses for the BPI average pain question were well correlated with responses on the WOMAC pain subscale (Spearman $r = 0.64$, $P < 0.001$). In multivariate logistic regression, patients with IPR had greater odds of being female [adjusted odds ratio (adjOR) 1.90 (95% CI 1.46, 2.48)] and having OA in both knees [adjOR 1.48 (95% CI 1.15, 1.90)], higher BMI, longer OA duration, depression or diabetes. Patients with IPR (vs non-IPR) were more likely to have worse QoL, greater function loss and greater pain interference.

CONCLUSION:

IPR is common among patients with knee OA requiring analgesics and is associated with large functional loss and impaired QoL. Patients at particular risk of IPR, as characterized in this study, may require greater attention towards their analgesic treatment options. Trial registration: <https://clinicaltrials.gov/> (NCT01294696).

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KEYWORDS: analgesic therapy; inadequate pain relief; knee; osteoarthritis PMID: 2515051

Sex differences

J Pain. 2014 Aug;15(8):867-77. doi: 10.1016/j.jpain.2014.05.004. Epub 2014 Jun 2.

Sex differences in the neural representation of pain unpleasantness.

Girard-Tremblay L¹, Auclair V¹, Daigle K¹, Léonard G¹, Whittingstall K², Goffaux P³.

Abstract

Sex differences in pain perception are still poorly understood, but they may be related to the way the brains of men and women respond to the affective dimensions of pain. Using a matched pain intensity paradigm, where pain intensity was kept constant across participants but pain unpleasantness was left free to vary among participants, we studied the relationship between pain unpleasantness and pain-evoked brain activity in healthy men and women separately. Experimental pain was provoked using transcutaneous electrical stimulation of the sural nerve while pain-related brain activity was measured using somatosensory-evoked brain potentials with source localization. Cardiac responses to pain were also measured using electrocardiac recordings. Results revealed that subjective pain unpleasantness was strongly associated with increased perigenual anterior cingulate cortex activity in women, whereas it was strongly associated with decreased ventromedial prefrontal cortex activity in men. Only ventromedial prefrontal cortex deactivations in men were additionally associated with increased autonomic cardiac arousal. These results suggest that in order to deal with pain's objectionable properties, men preferentially deactivate prefrontal suppression regions, leading to the mobilization of threat-control circuits, whereas women recruit well-known emotion-processing areas of the brain.

PERSPECTIVE:

This article presents neuroimaging findings demonstrating that subjective pain unpleasantness ratings are associated with different pain-evoked brain responses in men and women, which has potentially important implications regarding sex differences in the risk of developing chronic pain.

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KEYWORDS: Sex differences; brain; pain unpleasantness; somatosensory-evoked brain potential; source localization PMID: 24887007

Children of chronic pain parents

Parental chronic pain and offsprings substance use *Full Text*

Journal of Pain Research, 08/26/2014 Clinical Article

Kaasbøll J, et al.

Purpose: The aim of the present study was to investigate possible associations between parental chronic pain and smoking, alcohol, and drug use in adolescent offspring.

Methods: Cross-sectional data from Nord-Trøndelag Health Study (HUNT 3), a Norwegian population-based health survey conducted in the period 2006–2008 was utilized. The present sample consisted of adolescents aged 13–18 years ($n=3,227$) for whom information was available on maternal and paternal health statuses.

Results: Results from multivariable ordinal and binary logistic regression analyses, adjusting for potential confounding factors (child age, parental age, education, and organ specific illness) indicated that the estimated odds ratios (OR) for smoking (OR =1.72, 95% confidence interval [CI] [1.00, 3.05], $P=0.049$) and alcohol intoxication (drunkenness) (OR =1.56, 95% CI [1.05, 2.33], $P=0.029$) were higher for boys whose mother and father had chronic pain, compared with boys for whom neither parent had chronic pain. These associations were slightly attenuated by additional adjustment for pain-related factors, such as parental smoking and symptoms of anxiety and depression. Parental chronic pain was not significantly associated with girls' levels of substance use. There were significant interaction effects between parental chronic pain and child sex on offspring's alcohol and smoking.

Conclusion: The present study expands on existing knowledge and provides groundwork for preventive and specific measures targeting substance use in families burdened with parental chronic pain.

Keywords: adolescents, chronic pain, smoking, alcohol, drugs

Chronic pain and sexual problems

J Sex Med. 2014 Aug 7. doi: 10.1111/jsm.12651.

Prevalence and Risk Factors of Sexual Problems and Sexual Distress in a Sample of Women Suffering from Chronic Widespread Pain.

Burri A¹, Lachance G, Williams FM.

Abstract

INTRODUCTION:

Chronic widespread pain (CWP) is a prevalent musculoskeletal problem and a cardinal symptom of fibromyalgia, affecting up to 15% of the population. CWP is associated with substantial physical and psychological impairment and reduced quality of life.

AIM:

To describe sexual problems in women having CWP. To compare the sexual function between patients with CWP and healthy women, and to explore potential predictors of sexual problems in women suffering from CWP.

METHODS:

A descriptive, cross sectional study involving a total of 853 individuals, including 166 with CWP and 687 healthy counterparts. For the screening of sexual problems and distress, the original and amended lifelong version of the Female Sexual Function Index (FSFI) and the Female Sexual Distress Scale were applied. A set of standardized questionnaires to assess potential risk factors for sexual problems was further used.

MAIN OUTCOME MEASURES:

The levels of sexual function and distress in women with CWP was compared with those of healthy women. Univariate and multivariate linear regression was used to determine the potential predictors for sexual problems in women with CWP and healthy counterparts.

RESULTS:

Women with CWP reported more difficulties with lubrication, more sexual pain, and higher levels of sexual distress. Potential predictors of sexual problems in women with CWP were heterogeneous, with relationship dissatisfaction being associated with lower levels of sexual function in all the FSFI domains. Significant, domain-specific effects were further detected for anxiety sensitivity, emotional intelligence, obsessive compulsive behavior, and the big five personality traits. In general, factors influencing recent sexual problems were different from those influencing lifelong sexual function.

CONCLUSIONS:

CWP patients report more sexual pain and sexual distress compared with controls. Assessment of sexual problems should therefore be added to routine care of patients with CWP. Burri A, Lachance G, and Williams FMK. Prevalence and risk factors of sexual problems and sexual distress in a sample of women suffering from chronic widespread pain. *J Sex Med* **;***.**_**.

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KEYWORDS: CWP; Chronic Widespread Pain; FSD; Female Sexual Dysfunction; Fibromyalgia; Sexual Pain PMID: 25130789

MD empathy impact

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Accountability and Empathy Effects on Medical Students' Clinical Judgments in a Disability Determination Context for Low Back Pain.

Chibnall JT¹, Tait RC², Jovel A².

Abstract

Accountability has been shown to affect clinical judgments among health care providers in several ways. It may increase a provider's motivation for accuracy, leading to more deliberative judgments, or it may enhance biases that evaluators consistently demonstrate with patients with chronic pain. In this study, medical students read a vignette about a hypothetical patient referred for evaluation of severe low back pain by the Office of Vocational Rehabilitation. Accountability to the patient was either weak (consultative 1-time evaluation) or strong (ongoing primary care provision); societal accountability was either weak (evaluation information as secondary source for disability determination) or strong (evaluation information primary to disability determination). Participants then made judgments regarding validity of the patient's presentation, influence of psychosocial factors on the presentation, and patient's level of pain, distress, and disability, and completed an empathy measure. Results showed that empathy had strong associations with symptom validity and severity judgments. With empathy as a covariate, 3 crossover interactions emerged. Judgments of symptom validity were lower when the 2 forms of accountability were inconsistent (ie, one weak and the other strong) than when they were consistent (ie, both weak or both strong). Likewise, judgments of psychosocial factors and pain/distress/disability were higher under consistent accountability conditions than when accountability conditions were inconsistent. This pattern may imply conflict avoidance or self-protection as a motivation for judgments under inconsistent accountability. This study demonstrated that role demands can affect symptom judgments in complex ways, and that empathy may play both direct and moderating roles. Because physicians are the primary gatekeepers regarding disability determination in both consultative and treating roles, accountability may have significant mediating effects on such determinations.

PERSPECTIVE:

This study demonstrated that medical student judgments of pain-related symptoms were strongly associated with their levels of empathic concern. Student judgments of symptom validity and psychosocial influences on patient adjustment were differentially affected by their level of accountability to the patient and society in a disability determination process.

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KEYWORDS: Chronic low back pain; accountability; clinical judgments; disability; empathy
PMID: 24952111

Fibromyalgia

Insular cortex

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Altered resting state connectivity of the insular cortex in individuals with fibromyalgia.

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Abstract

The insular cortex (IC) and cingulate cortex (CC) are critically involved in pain perception. Previously we demonstrated that fibromyalgia (FM) patients have greater connectivity between the insula and default mode network at rest, and that changes in the degree of this connectivity were associated with changes in the intensity of ongoing clinical pain. In this study we more thoroughly evaluated the degree of resting-state connectivity to multiple regions of the IC in individuals with FM and healthy controls. We also investigated the relationship between connectivity, experimental pain, and current clinical chronic pain. Functional connectivity was assessed using resting-state functional magnetic resonance imaging in 18 FM patients and 18 age- and sex-matched healthy controls using predefined seed regions in the anterior, middle, and posterior IC. FM patients exhibited greater connectivity between 1) right mid IC and right mid/posterior CC and right mid IC, 2) right posterior IC and left CC, and 3) right anterior IC and left superior temporal gyrus. Healthy controls displayed greater connectivity between left anterior IC and bilateral medial frontal gyrus/anterior cingulate cortex; and left posterior IC and right superior frontal gyrus. Within the FM group, greater connectivity between the IC and CC was associated with decreased pressure-pain thresholds.

PERSPECTIVE:

These data provide further support for altered resting-state connectivity between the IC and other brain regions known to participate in pain perception/modulation, which may play a pathogenic role in conditions such as FM. We speculate that altered IC connectivity is associated with the experience of chronic pain in individuals with FM.

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KEYWORDS: Fibromyalgia; chronic pain; cingulate cortex; insular cortex; resting-state connectivity PMID: 24815079

Drugs

Eur J Pain. 2014 Sep;18(8):1067-80. doi: 10.1002/ejp.564.

More ubiquitous effects from non-pharmacologic than from pharmacologic treatments for fibromyalgia syndrome: A meta-analysis examining six core symptoms.

Perrot S¹, Russell IJ.

Abstract

This study aimed to characterize and compare the efficacy profile on six fibromyalgia syndrome (FM) core symptoms associated with pharmacologic and non-pharmacologic treatments. We screened PubMed, Embase and the Cochrane Library for FM articles from 1990 to September 2012 to analyse randomized controlled trials comparing pharmacologic or non-pharmacologic treatments to placebo or sham. Papers including assessments of at least 2 of the 6 main FM symptom domains - pain, sleep disturbance, fatigue, affective symptoms (depression/anxiety), functional deficit and cognitive impairment - were selected for analysis. Studies exploring pharmacologic approaches (n = 21) were mainly dedicated to treating a small number of dimensions, mostly pain. They were of good quality but were not prospectively designed to simultaneously document efficacy for the management of multiple core FM symptom domains. Only amitriptyline demonstrated a significant effect on as many as three core FM symptoms, but it exhibited many adverse effects and was subject to early tachyphylaxis. Studies involving non-pharmacologic approaches (n = 64) were typically of poorer quality but were more often dedicated to multidimensional targets. Pool therapy demonstrated significant effects on five symptom domains, repetitive transcranial magnetic stimulation on four domains, balneotherapy on three domains and exercise, cognitive behaviour therapy and massage on two domains each. Differences between pharmacologic and non-pharmacologic approaches may be related to different modes of action, tolerability profiles and study designs.

Very few drugs in well-designed clinical trials have demonstrated significant relief for multiple FM symptom domains, whereas non-pharmacologic treatments with weaker study designs have demonstrated multidimensional effects. Future therapeutic trials for FM should prospectively examine each of the core domains and should attempt to combine pharmacologic and non-pharmacologic therapies in well-designed clinical trials.

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NUTRITION/VITAMINS

Vit D

J Orthop Trauma. 2014 Sep;28(9):e210-5. doi: 10.1097/BOT.0000000000000053.

Prospective nutritional analysis of a diverse trauma population demonstrates substantial hypovitaminosis d.

Zellner BS¹, Dawson JR, Reichel LM, Schaefer K, Britt J, Hillin C, Reitman CA.

Abstract

OBJECTIVES:

There are several metabolic factors known to be important for the maintenance of bone and muscle function. Causes of deficiency are multifactorial and can include such things as geographic region, latitude, and socioeconomic factors. The purpose of this study was to determine the prevalence of metabolic deficiencies.

SETTING:

Level 1, urban trauma center.

DESIGN:

Prospective laboratory evaluation.

PATIENTS:

The subjects included 652 consecutive admits to the orthopaedic surgery service between July 1, 2011, and June 30, 2012.

INTERVENTION:

Laboratory evaluation.

MAIN OUTCOME MEASUREMENTS:

Metabolic and endocrine profiles included a serum analysis on all patients. Subject data included age, gender, body mass index, month of admission, and type of injury, and subjects' self-reported race, alcohol, recreational drug, and tobacco use were collected.

RESULTS:

Six hundred fifty-two subjects with an average age of 41.2 years were evaluated. After data analysis, only 25-hydroxyvitamin D levels were found to be persistently poor across the patient population: 86.2% of subjects were insufficient in 25-hydroxyvitamin D (<30 ng/mL), 53.2% were deficient (<20 ng/mL), and 14.0% had levels <10 ng/mL (severely deficient); 76.7% of the subjects increased skin pigmentation, and the differences in 25-hydroxyvitamin D levels between races were significantly different. African Americans had the highest risk of severe deficiency. 25-Hydroxyvitamin D levels were significantly higher during summer months, with men, and with a lower body mass index, but there were no differences based on age or substance use. Additional laboratory analysis did not reveal significant nutritional deficiency.

CONCLUSIONS:

The prevalence of hypovitaminosis D is widespread. This may negatively affect outcomes for orthopaedic patients but would be easily correctable. 25-Hydroxyvitamin D serologic analysis should be considered for all orthopaedic trauma patients.

LEVEL OF EVIDENCE: Prognostic Level IV. See Instructions for Authors for a complete description of levels of evidence. PMID: 24464095

NEUROLOGICAL CONDITIONS

Hemi gait

PM R. 2014 Aug 15. pii: S1934-1482(14)01329-X. doi: 10.1016/j.pmrj.2014.08.944.

Using an Ankle-Foot Orthosis improves Aerobic Capacity in Subacute Hemiparetic Stroke Patients.

Hyun CW¹, Kim BR², Han EY¹, Kim SM¹.

Abstract

OBJECTIVE:

To investigate aerobic capacity with and without an ankle-foot orthosis (AFO) in subacute hemiparetic stroke patients.

DESIGN:

Prospective crossover intervention study.

SETTING:

Rehabilitation clinic in secondary care.

PATIENTS:

Patients diagnosed with first-ever cerebral stroke involving the cortical or subcortical area resulting in hemiparesis (n = 15, eight men and seven women; average age, 62.1 years).

METHODS:

All subjects participated in two continuous, symptom-limited, low-velocity graded treadmill exercise stress tests under two different conditions (with and without an AFO). The rest interval between tests was at least 48 h. The order of exercise stress tests was randomized.

MAIN OUTCOME MEASUREMENTS:

To assess cardiorespiratory responses, oxygen consumption (V_{O_2}), heart rate (HR), systolic and diastolic blood pressure (SBP and DBP, respectively), rate pressure product (RPP), and respiratory exchange ratio (RER) were measured continuously throughout the test and peak values were obtained. The rating of perceived exertion (RPE) was recorded immediately after each test. The percentage of the age-predicted maximal HR and total exercise duration were also measured. Gait function was assessed by the 6 min walk test (6MWT).

RESULTS:

Using an AFO significantly increased V_{O_2} peak and 6MWT test results. Peak values of each of HR, SBP, DBP, RPP, and RER, RPE, the percentage of age-predicted maximal HR, and total exercise duration were similar regardless of AFO use.

CONCLUSIONS:

Using an AFO may improve aerobic capacity in subacute hemiparetic stroke patients, and may improve energy efficiency and gait endurance.

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KEYWORDS: Cardiopulmonary exercise test; Foot orthoses; Physical fitness; Stroke PMID: 25134853