

ABSTRACTS

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LUMBAR SPINE

Excursion of sciatic nerve

Sciatic nerve excursion during a modified passive straight leg raise test in asymptomatic participants and participants with spinally referred leg pain

Manual Therapy , 01/30/2015 Clinical Article

Abstract

Background

Minimal data exists on in-vivo sciatic nerve motion during straight leg raise (SLR), particularly in symptomatic participants. Such data could help clinicians to better understand nerve mechanic changes following nerve dysfunction.

Design

Cross-sectional, controlled laboratory study.

Objectives

To investigate whether individuals with spinally referred leg pain have different nerve excursion patterns compared to healthy participants.

Method

The sciatic nerve was scanned using ultrasound imaging in the posterior thigh in asymptomatic participants, and individuals with spinally referred leg pain sub-grouped into somatic pain, radicular pain or radiculopathy. Nerve excursion was measured in transverse and longitudinal planes during a side-lying modified SLR. The ultrasound data was analysed off-line using cross correlation software. Longitudinal plane data was collected from 16 asymptomatic and 60 symptomatic participants and transverse plane data from 16 asymptomatic and 56 symptomatic participants.

Results

There was no significant difference in longitudinal nerve excursion between the 4 groups. The direction of transverse plane motion altered between groups. These varied movements may be related to protective muscle activation between the groups, although this is speculative at present.

Conclusion

Longitudinal sciatic nerve excursion at the posterior thigh during a modified SLR is not different between asymptomatic participants and those with spinally referred leg pain. Transverse plane movement appears to be more varied. This may suggest that in individuals with nerve root pain, there is no restriction in nerve excursion. However, as it was not possible to measure excursion at the nerve root, more research is needed to confirm these findings.

LBP**Symptoms and activity**

Eur Spine J. 2015 Jan 18.

The association between symptom severity and physical activity participation in people seeking care for acute low back pain.

Gomes JL¹, Kingma M, Kamper SJ, Maher CG, Ferreira PH, Marques AP, Ferreira ML.

Author information

Abstract

PURPOSE:

To investigate the association between symptom severity and physical activity participation in people with acute non-specific low back pain (LBP).

METHODS:

The sample included a total of 999 patients who presented to primary care with an acute episode of low back pain. Symptom severity, in terms of activity limitation and severity of pain; and physical activity participation before (habitual) and after pain onset were assessed using self-report questionnaires. All participants were interviewed within 14 days of pain onset.

RESULTS:

At interview most of the participants (87.5 %) reported having moderate to extreme activity limitation due to back pain. There was a significant decrease in physical activity participation after pain onset (mean difference: -176 min, 95 % CI 327-400; $p < 0.0001$) but no association between habitual or change in physical activity participation and symptom severity was observed ($p > 0.21$).

CONCLUSION:

Pain onset causes a significant and immediate decrease in physical activity participation, but this change does not seem to be associated with symptom severity.

PMID: 25597041

Elevated Arterial Stiffness

J Spinal Disord Tech. 2015 Feb;28(1):E30-4. doi: 10.1097/BSD.000000000000140.

Physical Activity is Associated With Elevated Arterial Stiffness in Patients With Lumbar Disk Herniation.

Jin G¹, Cao ZG, Zhang YN, Li Y, Shen BZ.

Author information

Abstract

STUDY DESIGN:

A cross-sectional study in a general health examination.

OBJECTIVE:

To investigate the relationship between brachial-ankle pulse wave velocity (baPWV) and lumbar disk herniation (LDH).

SUMMARY OF BACKGROUND DATA:

Lumbar disk herniation (LDH) is a major cause of low back pain and sciatica. Various vascular risk factors such as obesity, diabetes mellitus, and smoking have been reported to be associated with LDH. BaPWV is an early indicator of subclinical atherosclerosis.

METHODS:

A total of 490 participants with LDH and 490 participants without LDH were selected for the evaluation of baPWV. BaPWV was measured using an automatic device. The prevalence of LDH was calculated by the quartiles of baPWV levels. Multiple linear regression analysis was performed to evaluate the risk factors for baPWV.

RESULTS:

LDH patients had significantly higher readings of baPWV compared with non-LDH subjects ($P < 0.001$). The prevalence rate of LDH gradually increased according to baPWV quartiles. In addition, the levels of baPWV tended to increase as the frequency of physical activity reduced. Multiple linear regression analysis showed that body mass index, low-density lipoprotein cholesterol, physical activity, and systolic blood pressure contributed to increased baPWV.

CONCLUSIONS:

The findings showed that LDH patients had higher baPWV levels. In addition, reduced physical activity was a risk factor contributing to increased baPWV. Further studies are warranted to determine the role of baPWV in LDH.

PMID:25075988

Motivators**Identifying potential moderators for response to treatment in low back pain: a systematic review**

Physiotherapy, 01/28/2015 Evidence Based Medicine Review Article Clinical Article

Gurung T, et al.

The aim of this study is to systematically review papers of therapist delivered interventions for low back pain to identify potential moderators to inform an individual patient data meta-analysis. There are insufficient robust data on moderators to be useful in clinical practice. This review has identified some important potential moderators of treatment effect worthy of testing in future confirmatory analyses.

Methods

- The authors searched MEDLINE, EMBASE, Web of Science and Citation Index and Cochrane Controlled Trial Registered (CENTRAL) databases for relevant papers.
- They screened for randomised controlled trials with ≥ 500 or more participants, and cohort studies of ≥ 1000 or more participants.
- They examined all publications related to these studies for any reported moderator analyses.
- Two reviewers independently did risk of bias assessment of main results and quality assessment of any moderator analyses.

Results

- They included four randomised trials ($n = 7,208$).
- Potential moderators with strong evidence ($p < 0.05$) in one or more studies were age, employment status and type, back pain status, narcotic medication use, treatment expectations and education.
- Potential moderators with weaker evidence ($0.05 < p \leq 0.20$) included gender, psychological distress, pain/disability and quality of life.

LBP and motor control

J Manipulative Physiol Ther. 2014 Dec 11. pii: S0161-4754(14)00243-7. doi: 10.1016/j.jmpt.2014.11.002.

A Comparison of Lumbopelvic Motion Patterns and Erector Spinae Behavior Between Asymptomatic Subjects and Patients With Recurrent Low Back Pain During Pain-Free Periods.

Sánchez-Zuriaga D¹, López-Pascual J², Garrido-Jaén D³, García-Mas MA⁴.

Author information

Abstract

OBJECTIVES:

The purpose of this study was to determine the patterns of lumbopelvic motion and erector spinae (ES) activity during trunk flexion-extension movements and to compare these patterns between patients with recurrent low back pain (LBP) in their pain-free periods and matched asymptomatic subjects.

METHODS:

Thirty subjects participated (15 patients with disc herniation and recurrent LBP in their pain-free periods and 15 asymptomatic control subjects). A 3-dimensional videophotogrammetric system and surface electromyography (EMG) were used to record the angular displacements of the lumbar spine and hip in the sagittal plane and the EMG activity of the ES during standardized trunk flexion-extension cycles. Variables were maximum ranges of spine and hip flexion; percentages of maximum lumbar and hip flexion at the start and end of ES relaxation; average percentages of EMG activity during flexion, relaxation, and extension; and flexion-extension ratio of myoelectrical activity.

RESULTS:

Recurrent LBP patients during their pain-free period showed significantly greater ES activation both in flexion and extension, with a higher flexion-extension ratio than controls. Maximum ranges of lumbar and hip flexion showed no differences between controls and patients, although patients spent less time with their lumbar spine maximally flexed.

CONCLUSIONS:

This study showed that reduced maximum ranges of motion and absence of ES flexion-relaxation phenomenon were not useful to identify LBP patients in the absence of acute pain. However, these patients showed subtle alterations of their lumbopelvic motion and ES activity patterns, which may have important clinical implications.

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KEYWORDS: Low Back Pain; Lumbar Region; Movement; Muscle Relaxation; Paraspinal Muscles

PMID: 25499193

McGill pain questionnaire

J Pain. 2015 Jan 29. pii: S1526-5900(15)00050-4. doi: 10.1016/j.jpain.2015.01.012.

Validation of the Short-form McGill Pain Questionnaire-2 (SF-MPQ-2) in Acute Low Back Pain.

Dworkin RH¹, Turk DC², Trudeau JJ³, Benson C⁴, Biondi DM⁴, Katz NP⁵, Kim M⁴.

Author information

Abstract

The Short-form McGill Pain Questionnaire (SF-MPQ-2) assesses the major symptoms of both neuropathic and non-neuropathic pain and can be used in studies of epidemiology, natural history, pathophysiologic mechanisms, and treatment response. Previous research has demonstrated its reliability, validity, and responsiveness in diverse samples of patients with chronic pain. However, the SF-MPQ-2 has not been evaluated for use in patients with acute pain. Data were examined from a double-blind, randomized clinical trial of immediate-release tapentadol vs. immediate-release oxycodone in patients with acute low back and associated radicular leg pain (n = 666). Analyses of internal consistency, convergent validity, and confirmatory factor structure were conducted using baseline data, and analyses of responsiveness were conducted using baseline and endpoint data. The SF-MPQ-2 total score and its four subscale scores (continuous pain, intermittent pain, predominantly neuropathic pain, affective descriptors) generally showed good psychometric properties and (1) were internally consistent; (2) displayed good convergent validity; (3) fit the a priori factor structure; and (4) were highly responsive to analgesic treatment. These data extend previous evidence of the reliability, validity, and responsiveness of the SF-MPQ-2 in patients with chronic pain to those with acute low back and associated radicular leg pain.

PERSPECTIVE:

Considered together with the results of other recent studies, the data suggest that the SF-MPQ-2 can provide a valid, responsive, and efficient assessment of both neuropathic and non-neuropathic pain qualities for clinical trials and other clinical research examining patients with various acute and chronic pain conditions.

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KEYWORDS:

SF-MPQ-2; Short-form McGill Pain Questionnaire-2; acute pain; low back pain; pain quality

PMID: 25640290

Somatosensory function in spinal pain

Pain. 2015 Feb;156(2):203-14. doi: 10.1097/01.j.pain.0000460300.10583.f6.

Early changes in somatosensory function in spinal pain: a systematic review and meta-analysis.

Marcuzzi A¹, Dean CM, Wrigley PJ, Hush JM.

Author information

Abstract

Alterations in sensory processing have been demonstrated in chronic low back and neck pain. However, it has not been yet systematically summarized how early these changes occur in spinal pain. This systematic review examines the available literature measuring somatosensory function in acute (<6 weeks) and subacute (6-12 weeks) spinal pain. The protocol for this review has been registered on the International Prospective Register of Systematic Reviews (PROSPERO). An electronic search of 4 databases was conducted to retrieve studies assessing somatosensory function by quantitative sensory testing in adults with spinal pain of up to 12 weeks duration. Two reviewers independently screened the studies and assessed the risk of bias. Studies were grouped according to spinal pain condition (whiplash injury, idiopathic neck pain, and nonspecific low back pain), and, where possible, meta-analyses were performed for comparable results. Fifteen studies were included. Sources of bias included lack of assessor blinding, unclear sampling methods, and lack of control for confounders.

We found that: (1) there is consistent evidence for thermal and widespread mechanical pain hypersensitivity in the acute stage of whiplash, (2) there is no evidence for pain hypersensitivity in the acute and subacute stage of idiopathic neck pain, although the body of evidence is small, and (3) hyperalgesia and spinal cord hyperexcitability have been detected in early stages of nonspecific low back pain, although evidence about widespread effects are conflicting. Future longitudinal research using multiple sensory modalities and standardized testing may reveal the involvement of somatosensory changes in the development and maintenance of chronic pain.

PMID: 25599440

Two point discrimination

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 63–67

Are tactile acuity and clinical symptoms related to differences in perceived body image in patients with chronic nonspecific lower back pain?

Tomohiko Nishigami   Akira Mibu Michihiro Osumi Kouki Son Shyogo Yamamoto Saori Kajiwara Katsuyoshi Tanaka Ayako Matsuya Akihito Tanabe

DOI: <http://dx.doi.org/10.1016/j.math.2014.06.010>

Abstract

Clinically, perceived image of the lower back and the two-point discrimination (TPD) test are used as markers for evaluating alterations of cortical reorganization. The purpose of the present study was to examine whether TPD and selected clinical findings are different in subgroups of individuals with chronic nonspecific lower back pain (CNLBP) based on body image drawings. Forty-two patients with CNLBP and seventeen healthy individuals were recruited. Perceived body image, TPD and clinical profiles was measured. Of the patients with CNLBP, 42.8% had a normal perceived body image, 28.5% an expanded image, and 28.5% a shrunken image. The TPD distance threshold was significantly larger for the expanded subgroup (13.3 ± 6.8 mm) compared with the control (5.5 ± 3.8 mm; Difference, 7.8; 95%CI, 1.83 to 13.66; $p < 0.05$) and normal subgroups (4.5 ± 5.5 mm; Difference, 8.8; 95%CI, 2.90 to 14.59; $p < 0.05$).

No significant differences in pain intensity, duration of pain, Roland Morris Disability Questionnaire (RDQ), and Pain Catastrophizing Scale (PCS) scores were found between three body image subgroups. Our results suggest that TPD is increased in patients who report an expanded perceived image of the lower back compared with healthy individuals and patients who report a normal image. The effectiveness of new rehabilitation techniques may be evaluated by assessing perceived image of the lower back and TPD values for patients with CNLBP before and after treatment.

History taking

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 18–27

Diagnostic accuracy of self-report and subjective history in the diagnosis of low back pain with non-specific lower extremity symptoms: A systematic review

Susan Shultz Kristina Averell Angela Eickelman Holly Sanker Megan Burrowbridge Donaldson

DOI: <http://dx.doi.org/10.1016/j.math.2014.08.002>

Abstract

Subjective history questions/self-report items are commonly used to triage the patient with low back pain and related leg symptoms. However the value of the history taking process for decision-making to identify common classifications/diagnosis for patients presenting with low back related leg pain (LBRLP) have not been considered. The purpose of this study was to investigate the diagnostic accuracy of self-report items/history-taking questions used to identify patients with LBRLP.

Eligible studies included: 1)subjects with low back pain AND related lower extremity pain, 2)details of subjective examination/self-report items, 3)cohort, prospective/longitudinal studies, and randomized control trials, 4)use of statistical reporting, 5)an acceptable reference standard. Quality was evaluated using the *Quality Assessment of Diagnostic Accuracy Studies 2*. A synthesis of history items that met the threshold for at least a small shift in the likelihood of the condition with a $+LR \geq 2$ or $-LR \leq 0.5$ were reported.

Conditions commonly reported in the literature: lumbar spinal stenosis, lumbosacral nerve root compression/radiculopathy, disc herniation and neurophysiological low back pain \pm leg pain. Eleven studies met the inclusion criteria.

This is the first systematic review of diagnostic accuracy studies that examined only the history-taking items for their ability to identify LBRLP conditions. Clustering key items may provide a more precise clinical picture necessary to detect and treat a patient's presentation. History questions formed within the interview and their contributing value for decision-making remain understudied. There is a need for better designs to determine a more accurate diagnostic power to identify conditions with LBRLP.

INJECTIONS

Epidurals

A randomized, double-blind controlled trial of lumbar interlaminar epidural injections in central spinal stenosis: 2-year follow-up

Pain Physician, 01/29/2015 Manchikanti L, et al.

The aim of this study is to assess the effectiveness of lumbar interlaminar epidural injections with or without steroids in providing effective and long-lasting pain relief with improvement in functional status for the management of chronic low back and lower extremity pain related to lumbar central spinal stenosis. Lumbar interlaminar epidural injections of local anesthetic with or without steroids provide relief in a significant proportion of patients with lumbar central spinal stenosis.

Methods

- A randomized, double-blind, active-control trial was designed with the inclusion of 120 patients assigned to 2 groups.
- Group I patients received lumbar interlaminar epidural injections of local anesthetic (lidocaine 0.5%) 6 mL, whereas Group II received lumbar interlaminar epidural injections with local anesthetic (lidocaine 0.5%) 5 mL mixed with 1 mL of steroids and 6 mg of betamethasone.

Results

- Significant relief and functional status improvement was seen in 72% and 73% of patients in Groups I and II at the end of 2 years considering all participants; however, this was 84% and 85% in the successful group.
- Overall significant improvement was achieved for 65.7 ± 37.3 weeks in Group I and 68.9 ± 37.7 weeks in Group II at the end of 2 years when all participants were considered; whereas, this was 77 ± 27.8 weeks and 77.9 ± 30.2 weeks when they were separated into successful categories.
- The average number of procedures per patient was 5 to 6 in both groups.

SURGERY

PELVIC GIRDLE**Pelvis in athletes**

Br J Sports Med. 2015 Feb;49(3):176-82. doi: 10.1136/bjsports-2013-092932. Epub 2014 Mar 6.

Do MRI and ultrasound of the anterior pelvis correlate with, or predict, young football players' clinical findings? A 4-year prospective study of elite academy soccer players.

Robinson P¹, Grainger AJ¹, Hensor EM², Batt ME³, O'Connor PJ¹.

Author information

Abstract

AIMS:

To prospectively follow a cohort of elite young male professional soccer players with sequential symptom questionnaires and imaging of the anterior pelvis to determine the prevalence and severity of imaging findings.

METHODS:

34 male athletes (mean age 16.5 years) underwent clinical examination, history/symptom questionnaire, ultrasound and 1.5 T MRI of the anterior pelvis. Athletes then underwent annual questionnaire and ultrasound with MRI also performed every 18 months. Two experienced radiologists scored ultrasound (consensus) and MRI (independently) for abnormality including pubic bone, capsule and tendon oedema and scores correlated with symptoms and presence or absence of previous injuries.

RESULTS:

Over 4 years the participants fell from 34 to 22 in number with no withdrawals due to groin injury. On study entry no athletes had undergone previous hip or pelvic surgery. On MRI pubic bone oedema, secondary cleft, capsule/tendon oedema and enhancement did not differ substantively between players with and without history of previous injury. κ Analysis for MRI scoring showed excellent agreement (0.84-0.96) for pubic bone marrow oedema, secondary cleft, capsule/tendon oedema and enhancement. On ultrasound inguinal wall motion and adductor tendinopathy did not differ substantively between players with and without history of previous injury. Stability of imaging assessments over time showed no consistent difference.

CONCLUSIONS:

Pubic bone marrow and parasymphyseal findings (cleft, capsule/tendon oedema) on MRI or inguinal canal ballooning on ultrasound were frequently found in asymptomatic athletes and did not predict injury or symptom development.

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KEYWORDS: Athletics; Groin Injuries; MRI; Soccer; Ultrasound

PMID:24603080

PELVIC ORGANS

Pregnant women and pain

J Clin Nurs. 2015 Jan 26. doi: 10.1111/jocn.12742.

How do pregnant women manage lumbopelvic pain? Pain management and their perceived effectiveness.

Chang HY¹, Jensen MP, Lai YH.

Author information

Abstract

AIMS AND OBJECTIVES:

This study aims to (1) investigate the pain management treatments used by pregnant women with lumbopelvic pain and their perceived effectiveness and (2) identify the predictors of pain treatment use.

BACKGROUND:

A variety of treatments have been shown to be effective for reducing pregnancy-related lumbopelvic pain. However, the frequency of use of pain treatments and their perceived efficacy in pregnant women is still unknown. Knowledge regarding the use and perceived efficacy of these treatments would help guide clinical practice and inform future research.

DESIGN:

A cross-sectional design with consecutive sampling.

METHODS:

Participants were pregnant women in the 35th to 40th gestational week who reported lumbopelvic pain in an antenatal clinic of a medical centre in Taiwan. Questionnaires were administered assessing pain treatment use, pain relief associated with each treatment (e.g. perceived effectiveness), pain intensity, pain interference, pain endurance beliefs and demographic variables.

RESULTS:

Among 295 participants with lumbopelvic pain, only 34 (12%) sought pain treatment. The pain management treatments used included mechanical treatments (80% = 27/34), herbal medicine (9% = 3/34), exercise (6% = 2/34) and medications (6% = 2/34). Average perceived effectiveness associated with the treatments was 55%. Use of pain management strategies was negatively associated with pain endurance beliefs, but not with pain intensity or pain interference.

CONCLUSIONS:

Pregnant women with lumbopelvic pain are unlikely to seek or use pain management treatments for pain, suggesting a greater need for adopting effective pain treatment in clinical settings.

RELEVANCE TO CLINICAL PRACTICE:

The study contributes new knowledge regarding how pregnant women cope with lumbopelvic pain and reveals very low rates in the use of pain treatments. Health professionals should assess pregnant women's pain beliefs about pain endurance and emphasise the safety and effectiveness of interventions that have empirical support, to help minimise unnecessary pain during pregnancy.

KEYWORDS: low back pain; pain management; pelvic girdle pain; pregnancy

PMID: 25620430

Pelvic floor pain

Int Urogynecol J. 2014 Dec 20.

A pilot randomized trial of levator injections versus physical therapy for treatment of pelvic floor myalgia and sexual pain.

Zoorob D¹, South M, Karram M, Sroga J, Maxwell R, Shah A, Whiteside J.

Author information**Abstract****INTRODUCTION AND HYPOTHESIS:**

Our aim was to determine the effects of pelvic floor physical therapy (PT) and levator-directed trigger-point injections (LTPI) on sexual function and levator-related pelvic pain.

STUDY DESIGN:

A randomized trial among women with pelvic floor myalgia (PFM) was performed wherein participants received either PT or LTPI. Pain was assessed and 1 month posttreatment completion. Levator-based pain was assessed using a numeric rating scale (NRS) and the Patient Global Impression of Improvement (PGI-I) scale. Sexual function was assessed using the Female Sexual Function Index (FSFI).

RESULTS:

Twenty-nine women completed the study (17 had PT, 12 had LTPI). Both groups reported reduction in vaginal pain: mean NRS change from baseline of 4.47 [standard deviation (SD) 2.12] for PT and 4.67 (SD 1.72) for LTPI ($p = 0.8$). A $>50\%$ improvement in NRS was documented among 59% of women receiving PT and 58% receiving LTPI ($p = 1.0$). Consistent with NRS scores, mean PGI-I score was 2.50 (SD 1.17) for PT and 2.17 (SD 1.01) for LTPI ($p = 0.5$). Mean change in FSFI favored PT [PT +8.87 (SD 5.60), LTPI +4.00 (SD 5.24), $p = 0.04$], reflecting improvement in the sexual pain domain favoring PT ($p = 0.02$). However, the time in weeks to effect improvement favored LTPI if controlling for the degree of change in NRS ($p = 0.01$) and FSFI ($p = 0.01$).

CONCLUSIONS:

Vaginal myalgia and sex-related pain improved with pelvic floor PT and LTPI. Time-to-effect improvement and significance of therapy are dependent on treatment type.

PMID:25527482

Diastasis Rectus**February 2015** Volume 20, Issue 1, Pages 200–205**Prevalence and risk factors of diastasis recti abdominis from late pregnancy to 6 months postpartum, and relationship with lumbo-pelvic pain**Patrícia Gonçalves Fernandes da Mota   Augusto Gil Brites Andrade Pascoal Ana Isabel Andrade Dinis Carita Kari BøDOI: <http://dx.doi.org/10.1016/j.math.2014.09.002>**Abstract**

Diastasis recti abdominis (DRA) is an impairment characterized by a midline separation of the rectus abdominis muscles along the linea alba. It has its onset during pregnancy and the first weeks following childbirth. There is scant knowledge on both prevalence and risk factors for development of the condition.

The aim of this study was to investigate the prevalence of DRA at gestational week 35 and three timepoints postpartum, possible risk factors, and the relationship between DRA and lumbo-pelvic pain.

Ultrasound images of inter rectus distance (IRD) were recorded in 84 healthy primiparous women, at three locations on the linea alba. The IRD was measured at: gestational week 35 and 6–8, 12–14, and 24–26 weeks postpartum. Diagnosis of DRA was defined as 16 mm at 2 cm below the umbilicus. Independent sample *t*-test and binary logistic regression was used to assess differences and risk factors in women with and without DRA and women with and without lumbo-pelvic pain. $P < 0.05$ was considered statistically significant.

The prevalence of DRA decreased from 100% at gestational week 35–39% at 6 months postpartum. No statistically significant differences were found in prepregnancy body mass index (BMI), weight gain, baby's birth weight or abdominal circumference between women with and without DRA at 6 months postpartum. Women with DRA at 6 months postpartum were not more likely to report lumbo-pelvic pain than women without DRA.

DRA is prevalent at 6 months postpartum, but is not linked with lumbo-pelvic pain

Pelvic floor pain

Int Urogynecol J. 2014 Dec 20.

A pilot randomized trial of levator injections versus physical therapy for treatment of pelvic floor myalgia and sexual pain.

Zoorob D¹, South M, Karram M, Sroga J, Maxwell R, Shah A, Whiteside J.

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CONCLUSIONS:

Vaginal myalgia and sex-related pain improved with pelvic floor PT and LTPI. Time-to-effect improvement and significance of therapy are dependent on treatment type.

PMID: 25527482

VISCERA

IBS and diet

Gastroenterology. 2015 Jan 15. pii: S0016-5085(15)00069-4. doi: 10.1053/j.gastro.2015.01.007.

Diet in the Pathogenesis and Treatment of Inflammatory Bowel Diseases.

Lee D, Albenberg L, Compher C, Baldassano R, Piccoli D, Lewis JD, Wu GD.

Abstract

Some of the most common symptoms of the inflammatory bowel diseases (IBD, which include ulcerative colitis and Crohn's disease) are abdominal pain, diarrhea, and weight loss. It is therefore not surprising that clinicians and patients have wondered whether dietary patterns influence the onset or course of IBD. The question of what to eat is among the most commonly asked by patients and among the most difficult to answer by clinicians. There are therefore substantial variations in dietary behaviors of patients and recommendations for them, although clinicians do not routinely endorse specific diets for patients with IBD. Dietary clinical trials have been limited by their inability to include a placebo control, contamination of study groups, and inclusion of patients receiving medical therapies. Further challenges include accuracy of information on dietary intake, complex interactions between foods consumed, and differences in food metabolism among individuals. We review the roles of diet in the etiology and management of IBD, based on plausible mechanisms and clinical evidence.

Researchers have learned much about the effects of diet on the mucosal immune system, epithelial function, and the intestinal microbiome; these findings could have significant practical implications. Controlled studies of patients receiving enteral nutrition and observations made from patients on exclusion diets have shown that components of whole foods can have deleterious effects for patients with IBD. Additionally, studies in animal models suggested that certain nutrients can reduce intestinal inflammation.

In the future, engineered diets that restrict deleterious components but supplement beneficial nutrients could be used to modify the luminal intestinal environment of patients with IBD—these might be used alone or in combination with immunosuppressive agents, or as salvage therapy for patients who do not respond or lose responsiveness to medical therapies. Stricter diets might be required to induce remission, whereas more sustainable exclusion diets could be used to maintain long-term remission.

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KEYWORDS: IBD; diet; pathogenesis; therapy

PMID: 25597840

IBS and tooth loss

J Oral Rehabil. 2015 Jan 27. doi: 10.1111/joor.12277.

Is tooth loss associated with irritable bowel syndrome?

Esmailzadeh A¹, Keshteli AH, Saneei T, Saneei P, Savabi O, Adibi P.

Author information

Abstract

Although the relationship between number of teeth and gastric disturbances has been recognised, limited data are available linking tooth loss and irritable bowel syndrome (IBS). This study aimed to investigate the relation between dental status and IBS among Iranian adults. In a cross-sectional study on 4669 Iranian adults, dental status was evaluated using a self-administered questionnaire. Participants were categorised into five main groups: those with full dentition (without denture), those with denture, individual who had lost 1-2 teeth, 3-5 teeth and half of one jaw or more. IBS and its subtypes were defined using Rome III criteria. After adjusting for different confounding variables, those who had lost 1-2 and 3-5 teeth had 1.35 and 1.33 times greater odds for IBS than fully dentate subjects, respectively. After controlling for different confounders, individuals who had denture had 103% greater odds to have constipation-predominant IBS than those with full dentition (95% confidence interval: 1.29-3.21).

Neither in crude nor in adjusted models were any significant association between dental status and other subtypes of IBS. In addition, we did not find any association between losing half of one jaw or more and IBS. We found that losing 1-2 or 3-5 teeth might significantly be associated with increased risk of IBS. Having denture might be related to constipation-predominant IBS. There should be further prospective studies to confirm these findings.

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KEYWORDS: functional gastrointestinal disorders; irritable bowel syndrome; masticatory function; tooth loss

PMID: 25623278

IBS and somatization

Aliment Pharmacol Ther. 2015 Jan 14. doi: 10.1111/apt.13074.

Irritable bowel syndrome is significantly associated with somatisation in 840 patients, which may drive bloating.

Patel P¹, Bercik P, Morgan DG, Bolino C, Pintos-Sanchez MI, Moayyedi P, Ford AC.

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

Psychological factors may influence persistence and perceived severity of symptoms in irritable bowel syndrome (IBS). Literature suggests that somatisation is associated with IBS. However, the relationship between IBS subtype, symptoms of IBS and somatisation is unclear.

AIM:

To examine this issue in a large cohort of secondary care patients.

METHODS:

Demographic and gastrointestinal (GI) symptom data were collected from 4224 adult patients via the Rome III questionnaire. Somatisation data were collected using the patient health questionnaire-12. Mean somatisation score and number of somatic symptoms were compared between IBS patients and controls with minimal GI symptoms, and between IBS subtypes using analysis of variance. Effect of level of somatisation on symptom frequency was compared according to IBS subtype using a χ^2 test.

RESULTS:

840 patients met Rome III criteria for IBS, controls were 2137 patients with GI symptoms without IBS. Mean somatisation scores and number of somatic symptoms were higher in IBS vs. controls ($P < 0.001$), and in mixed stool pattern IBS (IBS-M), vs. IBS with constipation (IBS-C) or diarrhoea (IBS-D) ($P < 0.001$). High levels of somatisation were more prevalent in IBS-M (31.7%) vs. IBS-C (22.5%) or IBS-D (20.8%) ($P = 0.003$). For all IBS subtypes, high levels of somatisation were associated with a greater frequency of bloating or abdominal distension prior to logistic regression.

CONCLUSIONS:

IBS is strongly associated with higher levels of somatisation, particularly IBS-M. Bloating may be associated with higher levels of somatisation, perhaps explaining why it can be difficult to treat.

PMID: 25586008

CERVICAL SPINE

Neck pain and exercise

Effect of strength training in addition to general exercise in the rehabilitation of patients with non-specific neck pain. A randomized clinical trial

European Journal of Physical and Rehabilitation Medicine, 01/27/2015 Clinical Article
Rolving N, et al. –

The aim of this study is to compare the effect of two different exercise programs on pain, strength and fear–avoidance belief. This study indicates that in rehabilitation of subjects severely disabled by non–specific neck pain, there is no additional improvement on pain or muscle strength when neck exercises are given as a home–based program with a minimum of supervision. However, strength training of the painful muscles seems to be effective in decreasing fear–avoidance beliefs.

Methods

- Participants were randomized to either general physical activity (GPA group) or GPA and additional strength training of the neck and shoulder (SST group).
- The primary outcome was pain intensity.
- Secondary outcomes were muscle strength of the neck and shoulder and fear–avoidance belief.

Results

- Pain was significantly reduced within groups with a median of –1 (IQR: –3 to 0, $P<0.001$) in the SST group and –1 (IQR: –4 to 1, $P=0.046$) in the GPA group.
- The difference between groups was not significant.
- Changes in strength did not differ between groups.
- Both groups experienced significant increases in neck flexion strength of 14.7 N (IQR: –1 to 28.4, $P=0.001$) in the SST group and 6.9 N (IQR: –4.9 to 18.6, $P=0.014$) in the GPA group.
- Furthermore, the SST group achieved an increase of 18.6 N (IQR: –2.6 to 69.7, $P=0.005$) in neck extension.
- Fear–avoidance beliefs improved with 6 (IQR: 3 to 12, $P<0.001$) in the SST group, while the GPA group improved with 3 (IQR: 0 to 8, $P=0.004$).
- This between–group difference was significant ($P=0.046$).

Work related pain

Spine (Phila Pa 1976). 2014 Nov 7.

Work-Related Risk Factors for Neck Pain in the United States Working Population.

Yang H¹, Haldeman S, Nakata A, Choi B, Delp L, Baker D.

Author information

Abstract

STRUCTURE ABSTRACT:

Study Design. This study uses the Taylor linearized variance estimation method to compute weighted unadjusted and adjusted prevalence of neck pain by occupation, with a cross-section data set from the 2009-2012 National Health Interview Survey (NHIS). **Objective.** The goal of this study was to explore occupational patterns of neck pain and the relationship between long work hours and neck pain in the working population in the United States. **Summary of Background Data.** The past research has demonstrated that specific occupations have a high prevalence of neck pain. However, occupational patterns of neck pain in the United States have been understudied. **Methods.** Risk of neck pain was estimated using univariate and multivariate logistic regression with odds ratio (ORs) with 95% confidence interval (CI) as measures of association. **Results.** After controlling for demographic, socioeconomic status, and behavioral-related factors and compared with workers in Architecture and engineering occupation group, the top five occupational groups with significantly higher relative prevalence of neck pain included: Military specific (OR 2.50, 95%CI 1.17, 5.35); Arts, design, entertainment, sports and media (OR 1.70, 95%CI 1.34, 2.17); Life, physical and social science (OR 1.67, 95%CI 1.33, 2.11); Healthcare support (OR 1.55, 95%CI 1.23, 1.97) and Installation, maintenance and repair (OR 1.54, 95%CI 1.21, 1.96).

Compared with those who worked 40 hours, people who worked 46 to 59 hours (OR 1.20, 95%CI 1.10, 1.30) and 60 or more hours of work per week (OR 1.35, 95%CI 1.21, 1.51) were more likely to report neck pain. **Conclusions.** This study adds to the evidence that an individual's occupation and work hours affect workers' risk for neck pain. This study indicates a need for new research efforts and public policies targeted to workers who are susceptible to neck pain in the United States.

PMID: 25384052

UPPER C SPINE

Stroke and manipulations

J Manipulative Physiol Ther. 2015 Jan 14. pii: S0161-4754(14)00267-X. doi: 10.1016/j.jmpt.2014.12.001.

Risk of Stroke After Chiropractic Spinal Manipulation in Medicare B Beneficiaries Aged 66 to 99 Years With Neck Pain.

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

Author information

Abstract

OBJECTIVE:

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

METHODS:

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

RESULTS:

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

CONCLUSIONS:

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

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

PMID:25596875

WHIPLASH

CRANIUM/TMJ

Oral Health

J Oral Rehabil. 2015 Jan 19. doi: 10.1111/joor.12273.

Association between oral conditions and functional limitations in childhood.

Clementino MA¹, Pinto-Sarmiento TC, Costa EM, Martins CC, Granville-Garcia AF, Martins SP.

Author information

Abstract

The aim of this study was to evaluate the impact of oral conditions on functional limitations among preschoolers. A preschool-based, cross-sectional study was carried out with 843 preschoolers in Campina Grande, Brazil. Parents/caregivers answered a questionnaire addressing socio-demographic characteristics and perceptions regarding the general/oral health of their children as well as the Brazilian version of the Early Childhood Oral Health Impact Scale. The nonparametric Kruskal-Wallis test followed by Mann-Whitney test ($\alpha = 5\%$) was used to compare mean children's quality-of-life scores for each independent variable. Poisson regression analysis was used to test associations between the independent and dependent variables (difficulties eating, drinking and speaking) ($\alpha = 5\%$). The multivariate regression model involved a hierarchical approach with four levels (distal to proximal determinants): (i) socio-demographic aspects; (ii) health perceptions; (iii) oral conditions; and (iv) pain conditions.

The prevalence of negative impact on function was 24.7% for eating/drinking and 8.0% for speaking. Significant associations were found between toothache and negative impact on eating/drinking (PR = 5.38; 95%CI: 3.20-9.02) as well as between high severity dental caries and negative impact on speaking (PR = 14.91; 95%CI: 1.98-112.32). Dental caries, traumatic dental injury and malocclusion were not significantly associated with a negative impact on eating or drinking. However, toothache was an indicator of negative impact on eating/drinking and dental caries severity was an indicator of negative impact on speaking.

KEYWORDS: child; dental caries; oral health; preschool; quality of life; toothache

PMID:25597878

Tooth lose and IBS

J Oral Rehabil. 2015 Jan 27. doi: 10.1111/joor.12277.

Is tooth loss associated with irritable bowel syndrome?

Esmailzadeh A¹, Keshteli AH, Saneei T, Saneei P, Savabi O, Adibi P.

Author information**Abstract**

Although the relationship between number of teeth and gastric disturbances has been recognised, limited data are available linking tooth loss and irritable bowel syndrome (IBS). This study aimed to investigate the relation between dental status and IBS among Iranian adults. In a cross-sectional study on 4669 Iranian adults, dental status was evaluated using a self-administered questionnaire. Participants were categorised into five main groups: those with full dentition (without denture), those with denture, individual who had lost 1-2 teeth, 3-5 teeth and half of one jaw or more. IBS and its subtypes were defined using Rome III criteria. After adjusting for different confounding variables, those who had lost 1-2 and 3-5 teeth had 1.35 and 1.33 times greater odds for IBS than fully dentate subjects, respectively. After controlling for different confounders, individuals who had denture had 103% greater odds to have constipation-predominant IBS than those with full dentition (95% confidence interval: 1.29-3.21). Neither in crude nor in adjusted models were any significant association between dental status and other subtypes of IBS. In addition, we did not find any association between losing half of one jaw or more and IBS. We found that losing 1-2 or 3-5 teeth might significantly be associated with increased risk of IBS. Having denture might be related to constipation-predominant IBS. There should be further prospective studies to confirm these findings.

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KEYWORDS: *functional gastrointestinal disorders; irritable bowel syndrome; masticatory function; tooth loss*

PMID: 25623278

HEADACHES

Migraine and occipital function

Cephalalgia. 2015 Jan 28. pii: 0333102414566860.

Altered neurochemical coupling in the occipital cortex in migraine with visual aura.

Bridge H¹, Stagg CJ², Near J³, Lau CI⁴, Zisner A⁵, Cader MZ⁶.

Author information

Abstract

BACKGROUND:

Visual aura is present in about one-third of migraine patients and triggering by bright or flickering lights is frequently reported.

METHOD:

Using migraine with visual aura patients, we investigated the neurochemical profile of the visual cortex using magnetic resonance spectroscopy. Specifically, glutamate/creatine and GABA/creatine ratios were quantified in the occipital cortex of female migraine patients.

RESULTS:

GABA levels in the occipital cortex of migraine patients were lower than that of controls. Glutamate levels in migraine patients, but not controls, correlated with the blood-oxygenation-level-dependent (BOLD) signal in the primary visual cortex during visual stimulation.

CONCLUSION:

Migraine with visual aura appears to disrupt the excitation-inhibition coupling in the occipital cortex.

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KEYWORDS: GABA; Migraine; glutamate; magnetic resonance spectroscopy; visual cortex
PMID:25631169

Connectivity and Migraine's

Eur J Neurol. 2015 Jan 9. doi: 10.1111/ene.12636.

No abnormalities of intrinsic brain connectivity in the interictal phase of migraine with aura.

Hougaard A¹, Amin FM, Magon S, Sprenger T, Rostrup E, Ashina M.

Author information

Abstract

BACKGROUND AND PURPOSE:

Functional neuroimaging studies have shown hyperresponsiveness of cortical areas to visual stimuli in migraine patients with aura outside of attacks. This may be a key feature in the initiation of aura episodes and possibly also migraine headache attacks. It is unknown if cortical dysfunction is present at rest, i.e. in the absence of any external stimuli. Functional magnetic resonance imaging is a powerful technique for evaluating resting state functional connectivity, i.e. coherence of brain activity across cerebral areas. The objective of this study was to investigate resting-state functional brain connectivity in migraineurs with aura outside of attacks using functional magnetic resonance imaging.

METHODS:

Forty patients suffering from migraine with visual aura and 40 individually age and gender matched healthy controls with no history or family history of migraine were investigated. Following advanced denoising, the data were analyzed both in a hypothesis-driven fashion, testing for abnormalities involving 27 different brain areas of potential relevance to migraine with aura including the cortical visual areas, the amygdala and peri-aqueductal grey matter, and in a data-driven exploratory fashion (dual regression) in order to reveal any possible between-group differences of resting state networks. Age, gender, attack frequency and disease duration were included as nuisance variables.

RESULTS:

No differences of functional connectivity were found between patients and controls.

CONCLUSIONS:

The previously reported increased cortical hyperresponsivity in the interictal phase of migraine with aura is unlikely to be caused by abnormalities of intrinsic brain connectivity. The interictal migraine aura brain may be abnormally functioning only during exposure to external stimuli.

KEYWORDS: aura; functional magnetic resonance imaging; intrinsic connectivity; migraine; resting state

PMID:25573335

Folate and Migraine's

Headache. 2015 Jan 19. doi: 10.1111/head.12490.

Effects of Dietary Folate Intake on Migraine Disability and Frequency.

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

Author information

Abstract

BACKGROUND:

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

METHODS:

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

RESULTS:

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

CONCLUSIONS:

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

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

PMID:25598270

Migraine management

Headache. 2015 Jan;55(1):3-20. doi: 10.1111/head.12499.

The acute treatment of migraine in adults: the american headache society evidence assessment of migraine pharmacotherapies.

Marmura MJ¹, Silberstein SD, Schwedt TJ.

Author information**Abstract**

The study aims to provide an updated assessment of the evidence for individual pharmacological therapies for acute migraine treatment. Pharmacological therapy is frequently required for acutely treating migraine attacks. The American Academy of Neurology Guidelines published in 2000 summarized the available evidence relating to the efficacy of acute migraine medications. This review, conducted by the members of the Guidelines Section of the American Headache Society, is an updated assessment of evidence for the migraine acute medications. A standardized literature search was performed to identify articles related to acute migraine treatment that were published between 1998 and 2013. The American Academy of Neurology Guidelines Development procedures were followed.

Two authors reviewed each abstract resulting from the search and determined whether the full manuscript qualified for review. Two reviewers studied each qualifying full manuscript for its level of evidence. Level A evidence requires at least 2 Class I studies, and Level B evidence requires 1 Class I or 2 Class II studies. The specific medications - triptans (almotriptan, eletriptan, frovatriptan, naratriptan, rizatriptan, sumatriptan [oral, nasal spray, injectable, transcutaneous patch], zolmitriptan [oral and nasal spray]) and dihydroergotamine (nasal spray, inhaler) are effective (Level A). Ergotamine and other forms of dihydroergotamine are probably effective (Level B). Effective nonspecific medications include acetaminophen, nonsteroidal anti-inflammatory drugs (aspirin, diclofenac, ibuprofen, and naproxen), opioids (butorphanol nasal spray), sumatriptan/naproxen, and the combination of acetaminophen/aspirin/caffeine (Level A). Ketoprofen, intravenous and intramuscular ketorolac, flurbiprofen, intravenous magnesium (in migraine with aura), and the combination of isometheptene compounds, codeine/acetaminophen and tramadol/acetaminophen are probably effective (Level B). The antiemetics prochlorperazine, droperidol, chlorpromazine, and metoclopramide are probably effective (Level B). There is inadequate evidence for butalbital and butalbital combinations, phenazone, intravenous tramadol, methadone, butorphanol or meperidine injections, intranasal lidocaine, and corticosteroids, including dexamethasone (Level C). Octreotide is probably not effective (Level B). There is inadequate evidence to refute the efficacy of ketorolac nasal spray, intravenous acetaminophen, chlorpromazine injection, and intravenous granisetron (Level C).

There are many acute migraine treatments for which evidence supports efficacy. Clinicians must consider medication efficacy, potential side effects, and potential medication-related adverse events when prescribing acute medications for migraine. Although opioids, such as butorphanol, codeine/acetaminophen, and tramadol/acetaminophen, are probably effective, they are not recommended for regular use.

KEYWORDS: acute treatment; clinical trial; episodic migraine; migraine; pharmacology

PMID: 25600718

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

Pain Research and Management, 02/06/2015 Clinical Article

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

Methods

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

Results

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

Migraine management

Headache. 2015 Jan;55(1):3-20. doi: 10.1111/head.12499.

The acute treatment of migraine in adults: the american headache society evidence assessment of migraine pharmacotherapies.

Marmura MJ¹, Silberstein SD, Schwedt TJ.

Author information**Abstract**

The study aims to provide an updated assessment of the evidence for individual pharmacological therapies for acute migraine treatment. Pharmacological therapy is frequently required for acutely treating migraine attacks. The American Academy of Neurology Guidelines published in 2000 summarized the available evidence relating to the efficacy of acute migraine medications. This review, conducted by the members of the Guidelines Section of the American Headache Society, is an updated assessment of evidence for the migraine acute medications. A standardized literature search was performed to identify articles related to acute migraine treatment that were published between 1998 and 2013. The American Academy of Neurology Guidelines Development procedures were followed. Two authors reviewed each abstract resulting from the search and determined whether the full manuscript qualified for review. Two reviewers studied each qualifying full manuscript for its level of evidence. Level A evidence requires at least 2 Class I studies, and Level B evidence requires 1 Class I or 2 Class II studies. The specific medications - triptans (almotriptan, eletriptan, frovatriptan, naratriptan, rizatriptan, sumatriptan [oral, nasal spray, injectable, transcutaneous patch], zolmitriptan [oral and nasal spray]) and dihydroergotamine (nasal spray, inhaler) are effective (Level A). Ergotamine and other forms of dihydroergotamine are probably effective (Level B). Effective nonspecific medications include acetaminophen, nonsteroidal anti-inflammatory drugs (aspirin, diclofenac, ibuprofen, and naproxen), opioids (butorphanol nasal spray), sumatriptan/naproxen, and the combination of acetaminophen/aspirin/caffeine (Level A). Ketoprofen, intravenous and intramuscular ketorolac, flurbiprofen, intravenous magnesium (in migraine with aura), and the combination of isometheptene compounds, codeine/acetaminophen and tramadol/acetaminophen are probably effective (Level B). The antiemetics prochlorperazine, droperidol, chlorpromazine, and metoclopramide are probably effective (Level B).

There is inadequate evidence for butalbital and butalbital combinations, phenazone, intravenous tramadol, methadone, butorphanol or meperidine injections, intranasal lidocaine, and corticosteroids, including dexamethasone (Level C). Octreotide is probably not effective (Level B). There is inadequate evidence to refute the efficacy of ketorolac nasal spray, intravenous acetaminophen, chlorpromazine injection, and intravenous granisetron (Level C). There are many acute migraine treatments for which evidence supports efficacy.

Clinicians must consider medication efficacy, potential side effects, and potential medication-related adverse events when prescribing acute medications for migraine. Although opioids, such as butorphanol, codeine/acetaminophen, and tramadol/acetaminophen, are probably effective, they are not recommended for regular use.

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KEYWORDS: acute treatment; clinical trial; episodic migraine; migraine; pharmacology

PMID: 25600718

VESTIBULAR

CONCUSSIONS**SHOULDER GIRDLE****Functional Limitations**

J Sport Rehabil. 2015 Jan 22.

Descriptive Analysis of Common Functional Limitations Identified by Patients with Shoulder Pain.

Smith-Forbes EV¹, Moore-Reed SD, Westgate PM, Kibler WB, Uhl TL.

Author information

Abstract

CONTEXT:

Recent establishment of G-codes by the U.S. government requires therapists to report function limitations at initial evaluation. Limited information exists specific to the most common limitations in patients with shoulder pain.

OBJECTIVE:

To describe the most commonly expressed shoulder limitations with activities and their severity/level of impairment from a patient's perspective on the initial evaluation.

DESIGN:

Descriptive.

SETTING:

Patients reporting pain with overhead activity and seeking medical attention from one orthopedic surgeon were recruited as part of a cohort study.

PATIENTS:

176 shoulder anterior labral tear from anterior to posterior (SLAP), rotator cuff tendinopathy, combined SLAP and rotator cuff, and non-specific (female = 53, age = 41 ± 13 years; male = 123, age = 41 ± 12 years) INTERVENTIONS: Data were obtained on the initial visit from the Patient Specific Functional Scale (PSFS) questionnaire. Three researchers extracted meaningful concepts from the PSFS and linked them to the International Classification of Function (ICF) categories according to established ICF linking rules.

RESULTS:

176 participants yielded 765 meaningful concepts that were linked to the ICF with a 66% agreement between researchers prior to consensus. There were no differences between diagnoses. 88% of all patient reported functional limitations coded into meaningful concepts were represented by 10 ICF codes. 634 (83%) meaningful concepts were linked to the activities and participation domain while 129 (17%) were linked to the body function domain. Only two (0.26%) reported functional limitations were considered not definable (nd). The overall average initial impairment score on the PSFS = 4 ± 2.5 out of 10 points.

CONCLUSION:

Meaningful concepts from the activities and participation domain were most commonly identified as functional limitations and were more prevalent than limitations from the body function domain. This information helps identify some of the most common limitations in patients with shoulder pain that therapists can utilize to efficiently document patient functional impairment.

PMID: 25611598

Scapula motion

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 46–55

A new description of scapulothoracic motion during arm movements in healthy subjects

Alexandra Roren Marie-Martine Lefevre-Colau Serge Poiraudau Fouad Fayad Viviane Pasqui
Agnès Roby-Brami

DOI: <http://dx.doi.org/10.1016/j.math.2014.06.006>

Abstract

The participation of scapula motion in arm movement is clinically well known and recent three dimensional (3D) analyses using kinematic techniques have confirmed its importance. Scapular motion relative to the thorax has a theoretical maximum of 6 degrees of freedom (DoF), resulting from rotations at both clavicular joints (3 rotational DoF each). However, most recent kinematic studies have only analysed the 3D rotations of the scapula relative to the thorax. In the present study, the 3D translations of the barycentre of the scapula were considered in order to complete the description of movement at the shoulder complex. Eight healthy subjects performed arm elevation in the sagittal and frontal planes, simulated activities of daily living (hair combing and back washing) and maximum voluntary scapula movement (forward and backward rolling). Measurements were recorded using a 6 DoF electromagnetic device and the acromial method of analysis was used.

The results showed that 3D scapular rotations and translation of its barycentre were functionally consistent for all tasks. A principal component analysis (PCA) yielded three factors, explaining 97.6% of the variance. The first two factors (protraction and shrug, according to clinical descriptions) combined rotations and translations, consistent with the hypothesis that the scapula rolls over the curved thoracic surface. The third factor related to lateral-medial rotation, thus representing rotation in the plane tangential to the thorax. The PCA suggested that scapular motion can be described using these 3 DoF. This should be studied in a larger group of individuals, including patients with pathological conditions.

CLAVICLE

GLENOHUMERAL/SHOULDER**Total shoulder and return to sports**

Am J Sports Med. 2014 Nov 18. pii: 0363546514557940. [Epub ahead of print]

Do Patients Return to Sports and Work After Total Shoulder Replacement Surgery?

Bühlhoff M¹, Sattler P¹, Bruckner T², Loew M³, Zeifang F¹, Raiss P⁴.

Author information

Abstract

BACKGROUND:

Studies evaluating the return to sports and work after shoulder arthroplasty are rare, and there are no studies evaluating return to work after total shoulder arthroplasty (TSA).

HYPOTHESIS:

Patients undergoing TSA will be able to return to their preoperative sports levels and occupations.

STUDY DESIGN:

Case series; Level of evidence, 4.

METHODS:

A total of 154 patients with 170 TSAs for primary glenohumeral arthritis were included. Two subgroups were formed: patients who had participated in sports during the 5 years before surgery (group 1; n = 105 [68%]) and patients who had never participated in sports (group 2; n = 49 [32%]). The return-to-work rate in patients who had not retired after surgery were also analyzed, as were responses to a survey.

RESULTS:

The mean age at the time of surgery was 71 years (range, 33-88 years) in group 1 and 76 years (range, 54-88 years) in group 2. Mean follow-up time was 6.2 years (range, 2.5-12.6 years). Fifty-seven patients (54%) in group 1 participated in sports right up to the time of surgery. All 57 (100%) returned to sports after surgery. A further 3 patients (3%) from group 1 resumed sporting activity after surgery; swimming was the most popular sport. No patient in group 2 started sports activity after shoulder replacement surgery. Many of the patients, 14% of the entire group, had retired by final follow-up because of TSA. Fourteen percent of patients in group 1 and group 2 were pursuing their work at the time of most recent follow-up. Thirty patients of the entire cohort (19.5%) had to change their occupations because of surgery.

CONCLUSION:

Patients who participated in sports before TSA were successfully able to return to sports activities after surgery. Patients who did not participate in sports just before surgery were unlikely to start sports after surgery. Fourteen percent of the entire cohort was able to return to work after surgery.

KEYWORDS: activity; glenohumeral arthritis; sports participation; total shoulder arthroplasty

PMID: 25406301

O'Brien's test

Reinterpretation of O'Brien test in posterior labral tears of the shoulder

International Journal of Shoulder Surgery, 01/29/2015 Clinical Article

Owen JM, et al.

Background: Injuries to the posterior labrum are less common and more difficult to diagnose compared to anterior labral pathology. This may be in part due to difficulties in preoperative diagnosis. Posterior labral injuries cause abnormal loading of the rotator cuff with subsequent weakness. Examination using the O'Briens test tightens the posterior capsule and posteriorly translates the humeral head, stressing the labrum resulting in pain and weakness.

Method: A retrospective study.

Results: Of 74 patients diagnosed with a posterior labral tear at arthroscopy 55 had subjective weakness on performing a O'Briens test, a sensitivity of 83% and a positive predictive value (PPV) of 90%.

Conclusion: Multiple tests have been described for posterior labral pathology and none of these, on their own, have a high sensitivity rate. Posterior labral injuries can often be missed on magnetic resonance imaging scanning and also at surgery if not specifically looked for. Using a sign of clinically demonstrated weakness when performing the O'Briens test, and hence reinterpretation of the test, is sensitive, with a high PPV for posterior labral pathology and can help guide further treatment.

Shoulder injury and kinaesthesia

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 28–37

The effects of shoulder injury on kinaesthesia: A systematic review and meta-analysis

Charlotte Fyhr Linnéa Gustavsson Craig Wassinger Gisela Sole

DOI: <http://dx.doi.org/10.1016/j.math.2014.08.006>

Abstract

The aim of this systematic review was to synthesize the evidence for changes for proprioceptive variables consisting of movement and position sense in participants with glenohumeral musculoskeletal disorders. Five databases were searched until 13th August 2013. Methodological quality was assessed and meta-analyses were performed for active and passive joint reposition sense (AJPS and PJPS) and movement sense, determined with threshold to detection of passive motion (TTDPM). The search yielded 17 studies, four of which were classified as having high methodological quality, seven as moderate and six as low quality. For participants with post-traumatic glenohumeral instability, pooled findings indicate moderate evidence for higher TTDPM for involved shoulders compared to control groups and the contralateral uninvolved side, indicating decreased movement sense. For AJPS and PJPS there was moderate to limited evidence for significant increased errors for involved compared to uninvolved shoulders, but not when compared to the control groups.

Limited evidence was found for decreased AJPS acuity for patients with chronic rotator cuff pain and for patients with unspecified shoulder pain compared to healthy controls. Movement sense is most likely to be impaired after shoulder injury involving post-traumatic instability when compared to the contralateral shoulder and to controls, while deficits for AJPS and PJPS are more likely to be evident compared to the contralateral shoulder in participants with glenohumeral musculoskeletal disorders.

ROTATOR CUFF**Fatty infiltrate**

Clin Orthop Relat Res. 2015 Feb;473(2):674-82. doi: 10.1007/s11999-014-3963-5. Epub 2014 Sep 30.

Rotator cuff Fatty infiltration and atrophy are associated with functional outcomes in anatomic shoulder arthroplasty.

Lapner PL¹, Jiang L, Zhang T, Athwal GS.

Author information

Abstract

BACKGROUND: Shoulder arthroplasty provides reliable pain relief and restoration of function. However, the effects of fatty infiltration and atrophy in the supraspinatus and infraspinatus muscles on functional outcomes are not well understood.

QUESTIONS/PURPOSES: The purposes of this study were to (1) compare preoperative with postoperative fatty infiltration and atrophy of the supraspinatus and infraspinatus muscles after primary shoulder arthroplasty; and (2) identify any associations between these variables and outcome measures.

METHODS: A retrospective analysis was undertaken of 62 patients with a mean age of 67 years (range, 34-90 years) who underwent shoulder arthroplasty. CT scans were conducted preoperatively and at 12 months postoperatively. Outcome variables included the degree of supraspinatus and infraspinatus fatty infiltration (percent fatty infiltration and Goutallier grade), muscle area (percent muscle area and Warner atrophy grade), shoulder strength, and the Western Ontario Osteoarthritis Score (WOOS), American Shoulder and Elbow Surgeons score, and Constant outcome score.

RESULTS: Preoperatively, the mean percent fatty infiltration (FI) within the supraspinatus and infraspinatus was identical at 14%. One year after shoulder arthroplasty, both muscles had less fatty infiltration (6% and 7%, respectively; $p < 0.001$). Similarly, the Goutallier grade significantly improved postoperatively for the supraspinatus ($p = 0.0037$) and infraspinatus ($p = 0.0007$). Conversely, measures of muscle atrophy remained unchanged postoperatively ($p > 0.251$). Preoperatively, greater supraspinatus percent FI was negatively associated with preoperative shoulder strength ($r = 0.37$, $p = 0.001$) and Constant score ($r = 0.38$, $p = 0.001$). Postoperative infraspinatus percent FI was negatively associated with postoperative strength ($r = 0.3$, $p = 0.021$) and Constant score ($r = 0.3$, $p = 0.04$). Multivariable regression analysis of possible predictive factors demonstrated that preoperative supraspinatus percent muscle area ($p = 0.016$) and the diagnosis of osteoarthritis ($p = 0.017$) were associated with better followup WOOS scores, and preoperative supraspinatus strength was associated with postoperative strength ($p = 0.0024$). Higher degrees of preoperative percent FI were not associated with worse patient-reported outcomes postoperatively.

CONCLUSIONS: Supraspinatus and infraspinatus fatty infiltration improves after shoulder arthroplasty, whereas muscle area remains unchanged. Although further study of these variables is required, the negative associations identified between preoperative supraspinatus atrophy and the diagnosis of rheumatoid arthritis and postoperative quality-of-life outcome scores may aid the clinician in selecting the best treatment option for glenohumeral arthrosis and in the management of patient expectations.

LEVEL OF EVIDENCE: Level III, prognostic study.

PMID:25267270

Impact of surgery

Am J Sports Med. 2014 Apr 21.

Rotator Cuff Repair: Published Evidence on Factors Associated With Repair Integrity and Clinical Outcome.

McElvany MD¹, McGoldrick E, Gee AO, Neradilek MB, Matsen FA 3rd.

Author information

Abstract

BACKGROUND: Rotator cuff tears are common, and rotator cuff repair represents a major health care expense. While patients often benefit from rotator cuff repair, anatomic failure of the repair is not unusual.

PURPOSE: To identify the published evidence on the factors associated with retears and with suboptimal clinical outcomes of rotator cuff repairs.

STUDY DESIGN: Systematic review and meta-analysis of articles with evidence levels 1-4.

METHODS: A total of 2383 articles on rotator cuff repairs published between 1980 and 2012 were identified. Only 108 of these articles, reporting on over 8011 shoulders, met the inclusion criteria of reporting quantitative data on both imaging and clinical outcomes after rotator cuff repair. Factors related to the patients, their shoulders, the procedures, and the results were systematically categorized and submitted for meta-analysis.

RESULTS: While the number of relevant articles published per year increased dramatically over the period of the study, the clinical and anatomic results did not show improvement over this period. The weighted mean retear rate was 26.6% at a mean of 23.7 months after surgery. Retears were associated with more fatty infiltration, larger tear size, advanced age, and double-row repairs. Clinical improvement averaged 72% of the maximum possible improvement. Patient-reported outcomes were generally improved whether or not the repair restored the integrity of the rotator cuff. The inconsistent and incomplete data in the published articles limited the meta-analysis of factors affecting the outcome of rotator cuff repair.

CONCLUSION: In spite of a dramatic increase in the number of publications per year, there is little evidence that the results of rotator cuff repair are improving. The information needed to guide the management of this commonly treated and costly condition is seriously deficient. To accumulate the evidence necessary to inform practice, future clinical studies on the outcome of rotator cuff repair must report important data relating to each patient's condition, the surgical technique, the outcome in terms of integrity, and the change in patient self-assessed comfort and function.

KEYWORDS: outcome; retear; rotator cuff repair

PMID: 24753240

External rotation with towel under arm

J Sport Rehabil. 2015 Jan 22.

Shoulder Muscle Electromyography During Shoulder External Rotation Exercises With and Without Slight Abduction.

Sakita K¹, Seeley MK, Myrer JW, Hopkins JT.

Author information

Abstract

CONTEXT:

Standing and sidelying external rotation exercises produce high activation of the deltoid and infraspinatus. Slight shoulder abduction during these exercises may decrease deltoid activity and increase infraspinatus activity.

OBJECTIVE:

To determine if the addition of a towel under the arm during standing and sidelying external rotation affects infraspinatus, middle and posterior deltoid, and pectoralis major activation characteristics, compared to the no towel condition.

DESIGN:

Controlled laboratory study.

PARTICIPANTS:

20 male volunteers (age: 26 ± 3 yrs; height: 1.80 ± 0.07 m; mass: 77 ± 10 kg) who were right-hand dominant and had bilaterally healthy shoulders with no current cervical pathology, and no skin infection or shoulder lesion.

INTERVENTIONS:

External rotation exercises without a towel roll (0° shoulder abduction) and with a towel roll (30° shoulder abduction) were performed in a standing and sidelying position.

MAIN OUTCOME MEASURES:

Maximal voluntary isometric contraction for the infraspinatus, middle and posterior deltoid, and pectoralis major and external rotation in standing and sidelying with and without a towel roll were performed. Normalized average and peak surface EMG amplitude was compared between the towel conditions during standing and sidelying external rotation.

RESULTS:

Both infraspinatus and pectoralis major activity had no significant differences between the towel conditions in standing and sidelying ($P > 0.05$). In standing and sidelying, posterior deltoid activity was significantly greater with a towel roll ($P < 0.05$). Middle deltoid activity had no significant differences between the towel conditions in standing ($P > 0.05$). However, in sidelying, middle deltoid activity was significantly lower with a towel roll ($P < 0.05$).

CONCLUSION:

Middle deltoid activity decreased with a towel roll during sidelying exercises. More data are needed to determine if a towel roll could be used to potentially reduce superior glide during external rotation exercises.

PMID:25611493

Repair

Am J Sports Med. 2015 Feb;43(2):439-46. doi: 10.1177/0363546514560156. Epub 2014 Dec 15.

Biomechanical analysis of articular-sided partial-thickness rotator cuff tear and repair.

Mihata T¹, McGarry MH², Ishihara Y³, Bui CN², Alavekios D², Neo M⁴, Lee TQ⁵.

Author information

Abstract

BACKGROUND:

Articular-sided partial-thickness rotator cuff tears are common injuries in throwing athletes. The superior shoulder capsule beneath the supraspinatus and infraspinatus tendons works as a stabilizer of the glenohumeral joint.

PURPOSE: To assess the effect of articular-sided partial-thickness rotator cuff tear and repair on shoulder biomechanics. The hypothesis was that shoulder laxity might be changed because of superior capsular plication in transtendon repair of articular-sided partial-thickness rotator cuff tears.

STUDY DESIGN:

Controlled laboratory study.

METHODS: Nine fresh-frozen cadaveric shoulders were tested by using a custom shoulder-testing system at the simulated late-cocking phase and acceleration phase of throwing motion. Maximum glenohumeral external rotation angle, anterior translation, position of the humeral head apex with respect to the glenoid, internal impingement area, and glenohumeral and subacromial contact pressures were measured. Each specimen underwent 3 stages of testing: stage 1, with the intact shoulder; stage 2, after creation of articular-sided partial-thickness tears of the supraspinatus and infraspinatus tendons; and stage 3, after transtendon repair of the torn tendons by using 2 suture anchors.

RESULTS: Articular-sided partial-thickness tears did not significantly change any of the shoulder biomechanical measurements. In the simulated late-cocking phase, transtendon rotator cuff repair resulted in decreased maximum external rotation angle by 4.2° (P = .03), posterior shift of the humeral head (1.1-mm shift; P = .02), decreased glenohumeral contact pressure by 1.7 MPa (56%; P = .004), and decreased internal impingement area by 26.4 mm² (65%; P < .001) compared with values in the torn shoulder. In the acceleration phase, the humeral head shifted inferiorly (1.2-mm shift; P = .03 vs torn shoulder), and glenohumeral anterior translation (1.5-mm decrease; P = .03 vs torn shoulder) and subacromial contact pressure (32% decrease; P = .004 vs intact shoulder) decreased significantly after transtendon repair.

CONCLUSION: Transtendon repair of articular-sided partial-thickness supraspinatus and infraspinatus tears decreased glenohumeral and subacromial contact pressures at time zero; these changes might lead to reduced secondary subacromial and internal impingements and consequently progression to full-thickness rotator cuff tear. However, repair of the tendons decreased anterior translation and external rotation and changed the positional relationship between the humeral head and the glenoid.

CLINICAL RELEVANCE: Careful attention should be paid to shoulder laxity and range of motion when transtendon repair is chosen to treat articular-sided partial-thickness rotator cuff tears, specifically in throwing athletes.

KEYWORDS: *articular; partial thickness; repair; rotator cuff; tear*

PMID: 25512665

FOZEN SHOULDER**Frozen Shoulder**

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 2–9

Frozen shoulder contracture syndrome – Aetiology, diagnosis and management

Jeremy Lewis

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.006>

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.

IMPINGMENT**Injections and proprioception**

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 166–170

The effect of experimentally-induced subacromial pain on proprioception

Gisela Sole Hamish Osborne Craig Wassinger

DOI: <http://dx.doi.org/10.1016/j.math.2014.08.009>

Abstract

Shoulder injuries may be associated with proprioceptive deficits, however, it is unknown whether these changes are due to the experience of pain, tissue damage, or a combination of these. The aim of this study was to investigate the effect of experimentally-induced sub-acromial pain on proprioceptive variables. Sub-acromial pain was induced via hypertonic saline injection in 20 healthy participants. Passive joint replication (PJR) and threshold to detection of movement direction (TTDMD) were assessed with a Biodex System 3 Pro isokinetic dynamometer for baseline control, experimental pain and recovery control conditions with a starting position of 60° shoulder abduction. The target angle for PJR was 60° external rotation, starting from 40°. TTDMD was tested from a position of 20° external rotation.

Repeated measures ANOVAs were used to determine differences between PJR absolute and variable errors and TTDMD for the control and experimental conditions. Pain was elicited with a median 7 on the Numeric Pain Rating Scale. TTDMD was significantly decreased for the experimental pain condition compared to baseline and recovery conditions ($\approx 30\%$, $P = 0.003$). No significant differences were found for absolute ($P = 0.152$) and variable ($P = 0.514$) error for PJR. Movement sense was enhanced for the experimental sub-acromial pain condition, which may reflect protective effects of the central nervous system in response to the pain. Where decreased passive proprioception is observed in shoulders with injuries, these may be due to a combination of peripheral tissue injury and neural adaptations that differ from those due to acute pain.

SURGERY
ELBOW

WRIST AND HAND

TFCC

Arch Orthop Trauma Surg. 2015 Jan 10.

Update TFCC: histology and pathology, classification, examination and diagnostics.

Kirchberger MC¹, Unglaub F, Mühldorfer-Fodor M, Pillukat T, Hahn P, Müller LP, Spies CK.

Author information

Abstract

The TFCC is a crucial stabilizer of the DRUJ. Based on its superficial and deep fibers, the TFCC guarantees unrestricted pronation and supination which is essential for performing sophisticated tasks. The ability to perform complex movements is of uppermost importance for hand function. Therefore, a functional intact TFCC is a prerequisite in this context. The articular disc of the TFCC is a fibrocartilaginous extension of the superficial zone of hyaline articular cartilage which arises from the radius. The peripheral 10-40 % of the TFC is vascularized. Degeneration of the articular disc is common with increasing age. Even though the central part of the articular disc is avascular, potential regeneration of lesions could be detected. The Palmer and Atzei classifications of TFCC lesions are complementary. TFCC innervation is based on different nerves. There is a high variability. A diligent clinical examination facilitates specific tests which help to allocate symptoms to the pathology.

Therefore, a thorough clinical examination is not dispensable. Wrist arthroscopy remains the "gold standard" for diagnosing TFCC pathologies despite technical progress in imaging modalities. MR arthrography may have the potential to become a real alternative to wrist arthroscopy for diagnosing TFCC pathologies with technical progress in the future.

PMID: 25575720

CARPAL TUNNEL SYNDROME**Measuring**

Ultrasound Med Biol. 2015 Jan 22. pii: S0301-5629(14)00638-3. doi: 10.1016/j.ultrasmedbio.2014.09.020.

Detecting Median Nerve Strain Changes with Cyclic Compression Apparatus: A Comparison of Carpal Tunnel Syndrome Patients and Healthy Controls.

Yoshii Y¹, Ishii T², Tanaka T³, Tung WL⁴, Sakai S².

Author information

Abstract

The objective of this study was to detect differences in median nerve strain between patients with carpal tunnel syndrome and healthy controls using cyclic compression apparatus. Twenty-eight patients with idiopathic carpal tunnel syndrome and 30 normal patients were examined by ultrasound elastography. Median nerve strain, strain ratio of reference coupler and median nerve area and perimeter were measured. The areas under receiver operating characteristic curves were compared among the parameters. Median nerve strains of the patients were significantly smaller than those of the controls ($p < 0.001$). Strain ratios, areas and perimeters were significantly larger in the patients than in the controls ($p < 0.001$). The areas under curves were 0.963, 0.917, 0.759 and 0.706 for strain, strain ratio, area and perimeter, respectively.

The median nerve strain had the highest area under the curve. The ultrasonic strain measurements of the median nerve provided by the cyclic compression apparatus were superior to morphologic assessment in diagnosing carpal tunnel syndrome.

KEYWORDS: Carpal tunnel syndrome; Elastography; Median nerve; Strain; Ultrasound

PMID: 25619788

**HIP
REPLACEMENTS****Anesthesia comparisons**

J Bone Joint Surg Am. 2015 Feb 4;97(3):186-93. doi: 10.2106/JBJS.N.00612.

Effects of regional versus general anesthesia on outcomes after total hip arthroplasty: a retrospective propensity-matched cohort study.

Helwani MA¹, Avidan MS¹, Ben Abdallah A¹, Kaiser DJ¹, Clohisy JC¹, Hall BL¹, Kaiser HA¹.

Author information

Abstract

BACKGROUND:

Many orthopaedic surgical procedures can be performed with either regional or general anesthesia. We hypothesized that total hip arthroplasty with regional anesthesia is associated with less postoperative morbidity and mortality than total hip arthroplasty with general anesthesia.

METHODS:

This retrospective propensity-matched cohort study utilizing the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database included patients who had undergone total hip arthroplasty from 2007 through 2011. After matching, logistic regression was used to determine the association between the type of anesthesia and deep surgical site infections, hospital length of stay, thirty-day mortality, and cardiovascular and pulmonary complications.

RESULTS:

Of 12,929 surgical procedures, 5103 (39.5%) were performed with regional anesthesia. The adjusted odds for deep surgical site infections were significantly lower in the regional anesthesia group than in the general anesthesia group (odds ratio [OR] = 0.38; 95% confidence interval [CI] = 0.20 to 0.72; $p < 0.01$). The hospital length of stay (geometric mean) was decreased by 5% (95% CI = 3% to 7%; $p < 0.001$) with regional anesthesia, which translates to 0.17 day for each total hip arthroplasty. Regional anesthesia was also associated with a 27% decrease in the odds of prolonged hospitalization (OR = 0.73; 95% CI = 0.68 to 0.89; $p < 0.001$). The mortality rate was not significantly lower with regional anesthesia (OR = 0.78; 95% CI = 0.43 to 1.42; $p > 0.05$). The adjusted odds for cardiovascular complications (OR = 0.61; 95% CI = 0.44 to 0.85) and respiratory complications (OR = 0.51; 95% CI = 0.33 to 0.81) were all lower in the regional anesthesia group.

CONCLUSIONS:

Compared with general anesthesia, regional anesthesia for total hip arthroplasty was associated with a reduction in deep surgical site infection rates, hospital length of stay, and rates of postoperative cardiovascular and pulmonary complications. These findings could have an important medical and economic impact on health-care practice.

LEVEL OF EVIDENCE: *Therapeutic Level III. See Instructions for Authors for a complete description of levels of evidence.*

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PMID: 25653318

OA

IMPINGEMENT

Frequency of practice (football) and Cam dysfunction

Br J Sports Med. 2015 Jan 7. pii: bjsports-2014-094130. doi: 10.1136/bjsports-2014-094130.

The relationship between the frequency of football practice during skeletal growth and the presence of a cam deformity in adult elite football players.

Tak I¹, Weir A², Langhout R³, Waarsing JH⁴, Stubbe J⁵, Kerkhoffs G⁶, Agricola R⁴.

Author information

Abstract

BACKGROUND/AIM:

Cam deformity (CD) is likely a bony adaptation in response to high-impact sports practice during skeletal growth. We ascertained whether a dose-response relationship exists between the frequency of football practice during skeletal growth and the presence of a CD in adulthood, and if the age at which a football player starts playing football is associated with the presence of a CD in adulthood.

METHODS:

Prevalence of a CD (α angle $>60^\circ$) and a pathological CD (α angle $>78^\circ$) was studied using standardised anteroposterior (AP) and frog-leg lateral (FLL) radiographs that were obtained during seasonal screening. The age of starting to play football with a low frequency (LF; ≤ 3 times/week) and high frequency (HF; ≥ 4 times/week) was retrospectively assessed. The differences in prevalence of a CD per hip, in either view, between groups were calculated by logistic regression with generalised estimating equations.

RESULTS:

63 players (mean (\pm SD) age 23.1 (\pm 4.2) years) participated, yielding 126 hips for analysis. The prevalence of a CD in the FLL was 40% (n=82) in players who started playing HF football from the age of 12 years or above, and 64% (n=44) in those playing HF football before the age of 12 years (p=0.042). This was also true for a pathological CD (12% vs 30%, p=0.038). The AP views revealed no difference.

CONCLUSIONS:

Our results indicate a probable dose-response relationship between the frequency of football practice during skeletal growth and the development of a CD, which should be confirmed in future prospective studies.

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KEYWORDS: Bone; Growth; Hip; Radiology; Risk factor

PMID:25568331

Ossification of the posterior rim

J Bone Joint Surg Am. 2015 Feb 4;97(3):e11. doi: 10.2106/JBJS.N.00553.

Characterization of ossification of the posterior rim of acetabulum in the developing hip and its impact on the assessment of femoroacetabular impingement.

Morris WZ¹, Chen JY¹, Cooperman DR², Liu RW¹.

Author information

Abstract

BACKGROUND:

Many radiographic indices that are used to assess adolescents for femoroacetabular impingement rely on an ossified posterior acetabular wall. A recent study identified a secondary ossification center in the posterior rim of the acetabulum, the ossification of which may affect perceived acetabular coverage. The purpose of this study was to characterize ossification of the posterior rim of the acetabulum with use of a longitudinal radiographic study and quantify its impact on the radiographic assessment of femoroacetabular impingement.

METHODS:

In this study, we utilized a historical collection of annual radiographs made in a population of healthy adolescents. Six hundred and twelve anteroposterior radiographs of the left hip of ninety-eight patients were reviewed to identify the appearance, duration, and fusion of the secondary ossification center in the posterior rim of the acetabulum. The center-edge angle was then measured before appearance and after fusion of the secondary ossification center in a subset of ten patients who had $<5^\circ$ of rotation on all radiographs.

RESULTS:

The secondary ossification center in the posterior rim was identified in seventy-three of the ninety-eight subjects, with no significant difference between the sexes. The mean patient age at the time of radiographic appearance of this secondary ossification center was fourteen years for males and twelve years for females. The mean duration of radiographic appearance was ten months for both sexes. Serial center-edge angles were measured in a subset of ten patients, and they increased during posterior rim ossification by a mean of 4.1° .

CONCLUSIONS:

The secondary ossification center in the posterior rim of the acetabulum (the posterior rim sign) is a common radiographic finding that reliably appears for ten months around the time of triradiate closure. Posterior rim ossification led to a mean increase of 4° of perceived acetabular coverage through the center-edge angle. Given the narrow margin between normal coverage (33° to 36°) and acetabular overcoverage ($>40^\circ$), the use of radiographs in adolescents with incompletely ossified hips may lead to misinterpretation of acetabular coverage. In patients with open triradiate cartilage, magnetic resonance imaging may be considered for the assessment of femoroacetabular impingement.

CLINICAL RELEVANCE:

The posterior rim ossification sign is a normal finding in adolescent hip development and has important implications for the proper evaluation of femoroacetabular impingement.

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PMID: 25653327

[KNEE](#)

KNEE/ACL

Landing

Am J Sports Med. 2014 Nov 3. pii: 0363546514555322.

The Effects of 2 Landing Techniques on Knee Kinematics, Kinetics, and Performance During Stop-Jump and Side-Cutting Tasks.

Dai B¹, Garrett WE², Gross MT³, Padua DA⁴, Queen RM², Yu B⁵.

Author information

Abstract

BACKGROUND:

Anterior cruciate ligament injuries (ACL) commonly occur during jump landing and cutting tasks. Attempts to land softly and land with greater knee flexion are associated with decreased ACL loading. However, their effects on performance are unclear.

HYPOTHESIS:

Attempts to land softly will decrease peak posterior ground-reaction force (PPGRF) and knee extension moment at PPGRF compared with a natural landing during stop-jump and side-cutting tasks. Attempts to land with greater knee flexion at initial ground contact will increase knee flexion at PPGRF compared with a natural landing during both tasks. In addition, both landing techniques will increase stance time and lower extremity mechanical work as well as decrease jump height and movement speed compared with a natural landing during both tasks.

STUDY DESIGN:

Controlled laboratory study.

METHODS: A total of 18 male and 18 female recreational athletes participated in the study. Three-dimensional kinematic and kinetic data were collected during stop-jump and side-cutting tasks under 3 conditions: natural landing, soft landing, and landing with greater knee flexion at initial ground contact.

RESULTS: Attempts to land softly decreased PPGRF and knee extension moment at PPGRF compared with a natural landing during stop-jump tasks. Attempts to land softly decreased PPGRF compared with a natural landing during side-cutting tasks. Attempts to land with greater knee flexion at initial ground contact increased knee flexion angle at PPGRF compared with a natural landing during both stop-jump and side-cutting tasks. Attempts to land softly and land with greater knee flexion at initial ground contact increased stance time and lower extremity mechanical work, as well as decreased jump height and movement speed during both stop-jump and side-cutting tasks.

CONCLUSION: Although landing softly and landing with greater knee flexion at initial ground contact may reduce ACL loading during stop-jump and side-cutting tasks, the performance of these tasks decreased, as indicated by increased stance time and mechanical work as well as decreased jump height and movement speed.

CLINICAL RELEVANCE: Training effects tested in laboratory environments with the focus on reducing ACL loading may be reduced in actual competition environments when the focus is on athlete performance. The effects of training programs for ACL injury prevention on lower extremity biomechanics in athletic tasks may need to be evaluated in laboratories as well as in actual competitions.

KEYWORDS: ACL injuries; biomechanics; cutting; jump landing; performance

PMID: 25367015

NM training

Am J Sports Med. 2014 Feb 25.

Assessing the Effectiveness of Neuromuscular Training Programs in Reducing the Incidence of Anterior Cruciate Ligament Injuries in Female Athletes: A Systematic Review.

Stevenson JH¹, Beattie CS, Schwartz JB, Busconi BD.

Author information

Abstract

BACKGROUND: Anterior cruciate ligament (ACL) injuries are more common in female athletes because of anatomic and biomechanical factors. These injuries can have detrimental ramifications for the athlete and the health care system. Neuromuscular training programs have been designed to modify risk factors and prevent ACL injuries.

PURPOSE: This systematic review evaluates studies that assess the effectiveness of neuromuscular training programs in reducing ACL injuries in female athletes and provides an update to 2 previously published reviews.

STUDY DESIGN: Systematic review. **METHODS:** Medline, Cochrane, and CINAHL databases were searched for relevant journal articles published from 1995 to 2011. We performed a manual review of relevant articles, authors, and journals, including bibliographies from identified articles. Ten studies were included in this review.

RESULTS: Only 2 studies demonstrated a statistically significant decrease in ACL injuries with neuromuscular training programs. Two additional studies showed a statistically significant decrease in subgroup analyses only. Four studies did show a trend toward reduced ACL injuries with neuromuscular training programs but were unable to achieve statistical significance. Neuromuscular training programs utilizing plyometric exercises and a preseason component were the most beneficial. Two studies actually showed an increase in injuries with intervention programs.

CONCLUSION: Neuromuscular training programs may be a useful adjunct to training, but current literature precludes our universal recommendation of them.

KEYWORDS: *ACL; athlete; female; neuromuscular training*

PMID: 24569703

Altered biomechanics

Br J Sports Med. 2015 Feb;49(3):188-95. doi: 10.1136/bjsports-2013-092982. Epub 2014 Feb 21.

Anterior cruciate ligament injury alters preinjury lower extremity biomechanics in the injured and uninjured leg: the JUMP-ACL study.

Goerger BM¹, Marshall SW², Beutler AI³, Blackburn JT⁴, Wilckens JH⁵, Padua DA⁴.

Author information

Abstract

BACKGROUND:

Information as to how anterior cruciate ligament (ACL) injury and reconstructive surgery (ACLR) alter lower extremity biomechanics may improve rehabilitation and return to play guidelines, reducing the risk for repeat ACL injury.

AIM:

To compare lower extremity biomechanics before ACL injury and after subsequent ACLR for the injured and uninjured leg.

METHODS:

Baseline unilateral lower extremity biomechanics were collected on the dominant leg of participants without ACL injury when they entered the Joint Undertaking to Monitor and Prevent ACL (JUMP-ACL) study. Thirty-one participants with subsequent ACL injury, reconstructive surgery and full return to physical activity completed repeat, follow-up biomechanical testing, as did 39 uninjured, matched controls. Not all injured participants suffered injury to the dominant leg, requiring separation of those with ACL injury into two groups: ACLR-injured leg group (n=12) and ACLR-uninjured leg group (n=19). We compared the landing biomechanics of these three groups (ACLR-injured leg, ACLR-uninjured leg, control) before ACL injury (baseline) with biomechanics after ACL injury, surgery and return to physical activity (follow-up).

RESULTS:

ACL injury and ACLR altered lower extremity biomechanics, as both ACLR groups demonstrated increases in frontal plane movement (increased hip adduction and knee valgus). The ACLR-injured leg group also exhibited decreased sagittal plane loading (decreased anterior tibial shear force, knee extension moment and hip flexion moment). No high-risk biomechanical changes were observed in control group participants.

CONCLUSIONS:

ACL injury and ACLR caused movement pattern alterations of the injured and uninjured leg that have previously shown to increase the risk for future non-contact ACL injury.

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KEYWORDS: ACL; Biomechanics; Knee injuries

PMID: 24563391

Trends in ACL surgeries

J Knee Surg. 2015 Jan 30.

Trends and Demographics in Anterior Cruciate Ligament Reconstruction in the United States.

Leathers MP¹, Merz A¹, Wong J², Scott T¹, Wang JC¹, Hame SL¹.

Author information

Abstract

The purpose of this study was to identify the trends and demographics of patients undergoing arthroscopic anterior cruciate ligament (ACL) reconstruction in the United States. Patients who underwent arthroscopic ACL reconstruction between 2004 and 2009 were identified by searching Current Procedural Terminology codes in the PearlDiver Patient Record Database (PearlDiver Technologies, Fort Wayne, IN). The year of procedure, age, gender, and region of the United States were recorded for each patient. Associated meniscal procedures and the absence or presence of a femoral nerve block were also recorded. The incidence of ACL reconstruction significantly increased over the study period, from 40.9 cases per 10,000 patients in 2004 to 47.8 in 2009 ($p < 0.001$). Of these cases, 92.8% were associated with either meniscectomy or meniscal repair. ACL reconstruction was performed most commonly in patients aged 10 to 29 years ($p < 0.001$). A significant male predominance was observed with an incidence ratio of male-to-female of 2.03 ($p < 0.001$). The frequency of females undergoing ACL reconstruction as a proportion of the total number of annual cases increased from 2,295 in 2004 to 3,476 in 2009 ($p = 0.0031$). A significant increase in the annual proportion of ACL reconstruction performed under femoral nerve block was also observed, from 2.0% in 2004 to 8.3% in 2009 ($p < 0.001$).

The greatest incidence of ACL reconstruction occurred in the Western region of the United States. An increase in the rate of arthroscopic ACL reconstruction was observed between 2004 and 2009 and 92.8% of the ACL reconstructions were associated with a meniscal procedure. The majority of cases were performed in patients aged 10 to 29 years, with a male predominance. Increases were observed in the number of female cases and proportion performed under a femoral nerve block. The Western region of the United States was found to have a higher incidence of ACL reconstruction.

Thieme Medical Publishers 333 Seventh Avenue, New York, NY 10001, USA.

PMID: 25635874

MENISCUS

MRI vs. clinical assessment

J Sport Rehabil. 2015 Jan 22.

Clinical Assessment Versus MRI Diagnosis of Meniscus Tears.

Brady MP¹, Weiss W.

Author information

Abstract

A common injury among high level and recreational athletes, non-athletes, and the elderly is medial and lateral meniscus tears. Diagnosis of meniscus tears is done with clinical exam, magnetic resonance imaging (MRI), and arthroscopy. The gold standard is arthroscopy, however accuracy of a clinical exam versus MRI diagnosis of meniscus tears is in question. The clinician's ability to detect a meniscus tear is beneficial to the patient from a timing standpoint. The process of obtaining an MRI and results could be lengthy, but if the meniscus tear is accurately diagnosed clinically, the patient could be suspended from athletics or specific job duties, and prevent further injury. Additionally, rehabilitation could be initiated immediately, resulting in better outcomes for the patient.

The ability to diagnose a meniscus tear clinically could initiate the rehabilitation process much sooner than waiting for MRI testing and results. Beginning the rehabilitation phase earlier may lead to faster post-operative rehabilitation and better patient outcomes. Clinical detection of a meniscus tear will facilitate possible suspension, early treatment, and rehabilitation recommendations, however the MRI will provide more specific information about the injury including type and location of tear. Thus, surgical decisions such as operative versus non-operative, or meniscectomy versus repair would be based on MRI results.

PMID:25611122

Scaffolding repair

Arthroscopy. 2015 Jan 14. pii: S0749-8063(14)00937-2. doi: 10.1016/j.arthro.2014.11.019.

Resorbable Collagen Scaffolds for the Treatment of Meniscus Defects: A Systematic Review.

Warth RJ¹, Rodkey WG².

Author information

Abstract

PURPOSE:

The purpose of this study was to evaluate the clinical and structural outcomes after resorbable collagen meniscus scaffold implantation through a systematic review of the published literature.

METHODS:

A systematic search of both the PubMed and Embase databases was undertaken to identify all studies that reported clinical and/or structural outcomes after resorbable collagen meniscus scaffold implantation for the treatment of defects involving either the medial or lateral meniscus. Extracted data included study characteristics; surgical methods and rehabilitation protocols; objective outcomes; and preoperative and postoperative subjective outcome scores including Lysholm, Tegner, International Knee Documentation Committee, and visual analog scale scores.

RESULTS:

Thirteen studies were included in this review. There were 10 Level IV studies, 2 Level II studies, and 1 Level I study with follow-up intervals ranging from 3 months to 12.5 years. With a few exceptions, the study designs used in each study generally followed those which had been previously performed. Substantial differences in rehabilitation protocols and concomitant procedures were noted that may have had an effect on overall clinical outcomes. Objective findings were mostly consistent and typically showed minimal degenerative changes on postoperative radiographs, decreased signal intensity of the scaffold over time on magnetic resonance imaging, the presence of meniscus-like tissue at second-look arthroscopy, and good integration of new tissue as evidenced by histologic analysis of biopsy specimens. Most studies reported satisfactory clinical outcomes, and most patients showed substantial improvements in comparison with mean preoperative baseline values.

CONCLUSIONS:

On the basis of this systematic review, implantation of resorbable collagen scaffolds for the treatment of meniscus defects provides satisfactory clinical and structural outcomes in most cases. There is evidence that collagen meniscus scaffold implantation provides superior clinical outcomes when compared with partial meniscectomy alone.

LEVEL OF EVIDENCE: Level IV, systematic review of Level I, II, and IV studies.

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PMID: 25595693

PATELLA

Bracing

Ann Rheum Dis. 2015 Jan 16. pii: annrheumdis-2014-206376. doi: 10.1136/annrheumdis-2014-206376.

A randomised trial of a brace for patellofemoral osteoarthritis targeting knee pain and bone marrow lesions.

Callaghan MJ¹, Parkes MJ¹, Hutchinson CE², Gait AD³, Forsythe LM¹, Marjanovic EJ³, Lunt M¹, Felson DT⁴.

Author information

Abstract

OBJECTIVE:

Braces used to treat (PF) osteoarthritis (OA) may reduce contact stress across the PF joint. We hypothesised that in PF OA, braces would decrease knee pain and shrink PF bone marrow lesions (BMLs).

METHODS:

Eligible subjects had painful PF OA. Subjects were randomly allocated to brace or no brace for 6 weeks. Knee MRIs were acquired at baseline and 6 weeks. We measured BMLs on post-contrast fat suppressed sagittal and proton density weighted axial images. The primary symptom outcome was change in pain at 6 weeks during a preselected painful activity, and the primary structural outcome was BML volume change in the PF joint. Analyses used multiple linear regression.

RESULTS:

We randomised 126 subjects aged 40-70 years (mean age 55.5 years; 72 females (57.1%)). Mean nominated visual analogue scale (0-10 cm) pain score at baseline was 6.5 cm. 94 knees (75%) had PF BMLs at baseline. Subjects wore the brace for a mean of 7.4 h/day. 6 subjects withdrew during the trial. After accounting for baseline values, the brace group had lower knee pain than the control group at 6 weeks (difference between groups -1.3 cm, 95% CI -2.0 to -0.7; $p < 0.001$) and reduced PF BML volume (difference -490.6 mm³, 95% CI -929.5 to -51.7; $p = 0.03$) but not tibiofemoral volume (difference -53.9 mm³, 95% CI -625.9 to 518.2; $p = 0.85$).

CONCLUSIONS:

A PF brace reduces BML volume in the targeted compartment of the knee, and relieves knee pain.

TRIAL REGISTRATION NUMBER:

UK. ISRCTN50380458.

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KEYWORDS:

Knee Osteoarthritis; Rehabilitation; Treatment

PMID:25596158

Female patella pain

Med Sci Sports Exerc. 2015 Jan 20.

Femur Rotation Increases Patella Cartilage Stress in Females with Patellofemoral Pain.

Liao TC¹, Yang N, Ho KY, Farrokhi S, Powers CM.

Author information**Abstract****PURPOSE:**

To test the hypothesis that internal rotation of the femur increases patellofemoral joint stress in persons with patellofemoral pain (PFP).

METHODS:

Patella cartilage stress profiles of nine females with PFP were obtained during squatting using subject-specific finite element (FE) models of the patellofemoral joint (15° and 45° of knee flexion). Input parameters for the FE model included joint geometry, quadriceps muscle forces during squatting, and weight-bearing patellofemoral joint kinematics. The femur of each model was then internally rotated 5° and 10° along its long axis beyond that of the natural degree of rotation. Using a nonlinear FE solver, quasi-static loading simulations were performed to quantify patellofemoral joint stress.

RESULTS:

Compared to the natural position of the femur, mean hydrostatic pressure and mean octahedral shear stress were significantly higher when the femur was internally rotated 5° and 10°. No significant differences in stress variables were observed when the femur was rotated from 5° to 10°. These findings were consistent across both knee flexion angles (15° and 45°).

CONCLUSIONS:

The finding of elevated hydrostatic pressure and octahedral shear stress with internal rotation of the femur supports the premise that females with PFP who exhibit abnormal hip kinematics may be exposed to elevated patellofemoral joint stress.

PMID: 25606814

Patella dislocation**Reoccurrence of patella dislocation**

J Knee Surg. 2015 Jan 29.

First-Time Patellofemoral Dislocation: Risk Factors for Recurrent Instability.

Lewallen L¹, McIntosh A¹, Dahm D¹.

Author information

Abstract

Patellofemoral instability is a complex problem, which can be difficult to manage. The purpose of this study was to describe the demographics of patients with a first-time patellofemoral dislocation, and identify risk factors for recurrent instability. This was a single institution, institutional review board-approved, retrospective review of >2,000 patients with a patellar dislocation between 1998 and 2010. Inclusion criteria are as follows: (1) no prior history of patellofemoral subluxation or dislocation of the affected knee; (2) X-rays within 4 weeks of the initial instability episode; and (3) a dislocated patella requiring reduction, or history/findings suggestive of acute patellar dislocation (effusion/hemarthrosis, tenderness along the medial parapatellar structures, and apprehension with lateral patellar translation). Clinical records and radiographs were reviewed. The Caton-Deschamps and Insall-Salvati indices were used to evaluate patella alta. Trochlear dysplasia was assessed using the Dejour classification system. Skeletal maturity was graded based on the distal femoral and proximal tibial physes, using one of the following categories: open, closing, or closed.

Three hundred twenty-six knees (312 patients) met the aforementioned criteria. There were 145 females (46.5%) and 167 males (53.5%), with an average age of 19.6 years (range, 9-62 years). Thirty-five patients (10.7%) were treated with surgery after the initial dislocation. All others were initially managed nonoperatively. Of the 291 patients managed nonoperatively, 89 (30.6%) had recurrent instability, 44 (49.4%) of which eventually required surgery. Several risk factors for recurrent instability were identified, including younger age ($p < 0.01$), immature physes ($p < 0.01$), sports-related injuries ($p < 0.01$), patella alta ($p = 0.02$), and trochlear dysplasia ($p < 0.01$). Sixty-nine percent of patients with a first-time patellofemoral dislocation will stabilize with conservative treatment. However, patients younger than 25 years with trochlear dysplasia have a 60 to 70% risk of recurrence by 5 years.

This information is helpful when counseling patients on their risk for recurrent instability and determining the most appropriate treatment plan. The clinical tool shown in Fig. 4 may be especially useful.

Thieme Medical Publishers 333 Seventh Avenue, New York, NY 10001, USA.

PMID: 25633361

**KNEE/TOTAL
KNEE/EXERCISE
OSTEOARTHRITIS/KNEE**

FOOT AND ANKLE

Club foot treatment

J Child Orthop. 2015 Jan 22.

Early ultrasonographic evaluation of idiopathic clubfeet treated with manipulations, casts, and Botox®: a double-blind randomized control trial.

Howren AM¹, Jamieson DH, Alvarez CM.

Author information

Abstract

BACKGROUND:

The manipulations, casts, and Botox[®] method for treating idiopathic clubfoot is an alternative non-surgical treatment method. Botox[®]-induced reversible muscle paralysis of the gastrocsoleus enables a physician to manipulate and cast the clubfoot in greater dorsiflexion. Ultrasound is incorporated during the early treatment stages to monitor the underlying physiology of the muscle-tendon unit following Botox[®].

METHODS:

Ultrasonographic evaluation was performed parallel to a double-blind randomized control trial administering Botox[®] or placebo to correct clubfoot. Patients underwent two-dimensional ultrasound to monitor the length changes to the gastrocsoleus and Achilles tendon unit at two time points: pre-injection (baseline) and 6 weeks post-blinded injection. Gastrocsoleus and Achilles tendon length measurements were analyzed among placebo, Botox[®] and contralateral controls using repeated measures ANOVA.

RESULTS:

The baseline gastrocsoleus length of the clubfoot (322.4 pixels) before blinded injection appears shorter than controls (337.5 pixels), but fails to reach significance ($p = 0.05$). The complex length within each of the three treatment groups displayed no significant change between baseline and 6 weeks. The complex-tendon ratio and muscle-tendon ratio of the Botox[®] treatment group was significantly decreased compared to controls ($p = 0.049$ and 0.042 , respectively). Briefly, when expressed as a proportion, an increase in Achilles tendon length and decrease in gastrocsoleus is observed when clubfeet are treated with Botox[®].

CONCLUSIONS:

Only in the Botox[®] treatment cohort did the muscle shrink to uncover tendon (seen as a decreased complex-tendon ratio and muscle-tendon ratio) over the 6-week interval to effectively increase tendon length with respect to the unit as a whole.

PMID:25609054

Ankle instability**Ankle instability: presentation and management**

Orthopaedics and Trauma, 02/05/2015 Hossain M, et al.

Abstract

The ankle joint is akin to a mortise. Damage to this mortise joint with injury to either the medial, lateral or syndesmotic complex can result in chronic ankle instability. In this article we discuss the management of ankle instability, most commonly arising from injuries to the lateral ligament complex. Chronic ankle instability may develop from an inversion-type ankle sprain, usually affecting the anterior talo-fibular ligament (ATFL). Most affected patients improve with conservative management following this injury, but up to 30% of patients can develop debilitating chronic ankle symptoms. In assessing ankle instability it is important to differentiate between patients with functional instability and those with mechanical instability. Clinical assessment is the cornerstone of diagnosis, although stress views performed under anaesthesia (including the contralateral ankle for comparison) are useful. MRI is helpful in the assessment of soft tissue and cartilage injury.

Short periods of immobilisation and physiotherapy are the mainstay of acute treatment. Patients with functional instability may benefit from peroneal strengthening and proprioceptive rehabilitation. Surgery is recommended for patients with mechanical instability who fail conservative treatment. Anatomical ligament repair has the best results. Non-anatomic ligament reconstruction is reserved for revision cases although primary ligament reconstruction may have a role in selected cases.

Compartment syndrome

Am J Sports Med. 2015 Feb;43(2):392-8. doi: 10.1177/0363546514555970. Epub 2014 Nov 18.

Intramuscular compartment pressure measurement in chronic exertional compartment syndrome: new and improved diagnostic criteria.

Roscoe D¹, Roberts AJ², Hulse D³.

Author information

Abstract

BACKGROUND:

Patients with chronic exertional compartment syndrome (CECS) have pain during exercise that subsides with rest. Diagnosis is usually confirmed by intramuscular compartment pressure (IMCP) measurement. Controversy exists regarding the accuracy of existing diagnostic criteria.

PURPOSE:

(1) To compare dynamic IMCP measurement and anthropometric factors between patients with CECS and asymptomatic controls and (2) to establish the diagnostic utility of dynamic IMCP measurement.

STUDY DESIGN:

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

METHODS:

A total of 40 men aged 21 to 40 years were included in the study: 20 with symptoms of CECS of the anterior compartment and 20 asymptomatic controls. Diagnoses other than CECS were excluded with rigorous inclusion criteria and magnetic resonance imaging. The IMCP was measured continuously before, during, and after participants exercised on a treadmill, wearing identical footwear and carrying a 15-kg load.

RESULTS:

Pain experienced by study subjects increased incrementally as the study progressed ($P < .001$). Pain levels experienced by the case group during each phase of the exercise were significantly different ($P = .021$). Subjects had higher IMCP immediately upon standing at rest compared with controls (23.8 mm Hg [controls] vs 35.5 mm Hg [subjects]; $P = .006$). This relationship persisted throughout the exercise protocol, with the greatest difference corresponding to the period of maximal tolerable pain (68.7 mm Hg [controls] vs 114 mm Hg [subjects]; $P < .001$). Sensitivity and specificity were consistently higher than the existing criteria with improved diagnostic value (sensitivity = 63%, specificity = 95%; likelihood ratio = 12.5 [95% CI, 3.2-49]).

CONCLUSION:

Anterior compartment IMCP is elevated immediately upon standing at rest in subjects with CECS. In patients with symptoms consistent with CECS, diagnostic utility of IMCP measurement is improved when measured continuously during exercise. A cutoff of 105 mm Hg in phase 2 provides better diagnostic accuracy than do the Pedowitz criteria of 30 mm Hg and 20 mm Hg at 1 and 5 minutes after exercise, respectively.

KEYWORDS: anthropometric factors; chronic exertional compartment syndrome; diagnosis; exercise-induced leg pain; intramuscular compartment pressure

PMID: 25406302

Forefoot Varus and knee and hip motions

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 79–83

The effects of forefoot varus on hip and knee kinematics during single-leg squat*

Rodrigo Scattone Silva Carlos D. Maciel Fábio V. Serrão

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.001>

Abstract

Foot misalignments, such as forefoot varus (FV), have been associated with musculoskeletal injuries in the proximal joints of the lower limb. Previous theories suggested that this association occurs because FV influences knee and hip kinematics during closed kinetic chain activities. However, research on the effects of FV in the kinematics of the lower limb is very scarce. Therefore, the purpose of this study was to compare the knee and hip kinematics between subjects with and without FV during a functional weight-bearing activity. Forty-six healthy adolescents were divided into two groups: group of subjects with FV (VG, $n = 23$) and group of subjects with aligned forefoot (CG, $n = 23$). A kinematic evaluation was conducted while the subjects performed a single-leg squat task. The variables of interest were hip internal rotation and adduction and knee abduction excursions at 15°, 30°, 45° and 60° of knee flexion. Between-group comparisons were performed with multivariate analysis of variance.

Results showed that the VG presented greater hip internal rotation when compared with the CG across all evaluated knee flexion angles ($P = 0.02$ – 0.0001). No differences between groups were observed in hip adduction or knee abduction ($P > 0.05$). These results indicate that FV influences the transverse plane hip movement patterns during a functional weight-bearing activity. Considering that excessive hip internal rotation has been associated with knee injuries, these findings might contribute for a better understanding of the link between FV and injuries of the proximal joints of the lower limb.

SHOES/ORTHOTICS

Footwear and plantar loading

Assessing footwear effects from principal features of plantar loading during running

Medicine and Science in Sports and Exercise, 01/29/2015 Trudeau MB, et al.

Purpose: The effects of footwear on the musculoskeletal system are commonly assessed by interpreting the resultant force at the foot during the stance phase of running. However, this approach overlooks loading patterns across the entire foot. An alternative technique for assessing foot loading across different footwear conditions is possible using comprehensive analysis tools that extract different foot loading features, thus enhancing the functional interpretation of the differences across different interventions. The purpose of this paper was to use pattern recognition techniques to develop and utilize a novel comprehensive method for assessing the effects of different footwear interventions on plantar loading.

Methods: A principal component analysis (PCA) was used to extract different loading features from the stance phase of running, and a support vector machine (SVM) was used to determine if and how these loading features were different across 3 shoe conditions.

Results: The results revealed distinct loading features at the foot during the stance phase of running. The loading features determined from the PCA allowed successfully classifying all 3 shoes conditions using the SVM. Several differences were found in the location and timing of the loading across each pairwise shoe comparison using the output from the SVM.

Conclusion: The analysis approach proposed can successfully be used to compare different loading patterns with a much greater resolution than has been reported previously. This study has several important applications. One such application is that it would not be relevant for a user to select a shoe or for a manufacturer to alter a shoe's construction if the classification across shoe conditions would not have been significant.

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ANKLE/INSTABILITY

ACHILLES TENDON

Twisted structure

Scand J Med Sci Sports. 2014 Dec 30. doi: 10.1111/sms.12342.

The twisted structure of the human Achilles tendon.

Edama M¹, Kubo M, Onishi H, Takabayashi T, Inai T, Yokoyama E, Hiroshi W, Satoshi N, Kageyama I.

Author information

Abstract

The Achilles tendon (AT) consists of fascicles that originate from the medial head of the gastrocnemius (MG), lateral head of the gastrocnemius (LG), and soleus muscle (Sol). These fascicles are reported to have a twisted structure. However, there is no consensus as to the degree of torsion. The purpose of this study was to investigate the twisted structure of the AT at the level of fascicles that originate from the MG, LG, and Sol, and elucidate the morphological characteristics. Gross anatomical study of 60 Japanese cadavers (111 legs) was used. The AT fascicles originated from the MG, LG, and Sol were fused while twisting among themselves. There were three classification types depending on the degree of torsion. Further fine separation of each fascicle revealed MG ran fairly parallel in all types, whereas LG and Sol, particularly of the extreme type, were inserted onto the calcaneal tuberosity with strong torsion. In addition, the sites of Sol torsion were 3-5 cm proximal to the calcaneal insertion of the AT. These findings provide promising basic data to elucidate the functional role of the twisted structure and mechanisms for the occurrence of AT injury and other conditions.

KEYWORDS: Achilles tendinopathy; Japanese cadavers; gastrocnemius; soleus

PMID:25557958

PLANTAR SURFACE
HALLUX VALGUS
RHUMATOID ARTHRITIS

MANUAL THERAPY

Mulligan and LBP

Manual Therapy February 2015 Volume 20, Issue 1, Pages 103–108

The effects of a modified spinal mobilisation with leg movement (SMWLM) technique on sympathetic outflow to the lower limbs

Vasilis Tsirakis Jo Perry

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.002>

Abstract

Physiotherapy management of lumbar disorders, based on Mulligan's mobilization techniques, is a treatment of choice by many physiotherapists, however, there is only limited evidence of any neurophysiological effects and much of this has focused on the cervical spine and upper limbs. This study aims to extend the knowledge base underpinning the use of a modified Mulligan's spinal mobilisation with leg movement technique (SMWLM) by exploring its effects on the peripheral sympathetic nervous system (SNS) of the lower limbs. Using a single blind, placebo controlled, independent groups study design, 45 normal naive healthy males were randomly assigned to one of three experimental groups (control, placebo or treatment; SMWLM). SNS activity was determined by recording skin conductance (SC) obtained from lower limb electrodes connected to a BioPac unit. Validation of the placebo technique was performed by post-intervention questionnaire.

Results indicated that there was a significant change in SC from baseline levels (30%) that was specific to the side treated for the treatment group during the intervention period (compared to placebo and control conditions). This study provides preliminary evidence that a modified SMWLM technique results in side-specific peripheral SNS changes in the lower limbs.

CPR for LBP

RESEARCH REPORT

Diagnostic Clinical Prediction Rules for Specific Subtypes of Low Back Pain: A Systematic Review**Authors:** Robin Haskins, BPhy (Hons)¹, Peter G. Osmotherly, PhD¹, Darren A. Rivett, PhD¹

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Published: *Journal of Orthopaedic & Sports Physical Therapy*,2015, **Volume:** 45 **Issue:** 2 **Pages:** 61-76 doi:10.2519/jospt.2015.5723**Objectives** To identify diagnostic clinical prediction rules (CPRs) for low back pain (LBP) and to assess their readiness for clinical application.**Background** Significant research has been invested into the development of CPRs that may assist in the meaningful subgrouping of patients with LBP. To date, very little is known about diagnostic forms of CPRs for LBP, which relate to the present status or classification of an individual, and whether they have been developed sufficiently to enable their application in clinical practice.**Methods** A sensitive electronic search strategy using 7 databases was combined with hand searching and citation tracking to identify eligible studies. Two independent reviewers identified relevant studies for inclusion using a 2-stage selection process. The quality appraisal of included studies was conducted by 2 independent raters using the Quality Assessment of Diagnostic Accuracy Studies-2 and checklists composed of accepted methodological standards for the development of CPRs.**Results** Of 10 014 studies screened for eligibility, the search identified that 13 diagnostic CPRs for LBP have been derived. Among those, 1 tool for identifying lumbar spinal stenosis and 2 tools for identifying inflammatory back pain have undergone validation. No impact analysis studies were identified.**Conclusion** Most diagnostic CPRs for LBP are in their initial development phase and cannot be recommended for use in clinical practice at this time. Validation and impact analysis of the diagnostic CPRs identified in this review are warranted, particularly for those tools that meet an identified unmet need of clinicians who manage patients with LBP.**Level of Evidence** Diagnosis, level 2a-. *J Orthop Sports Phys Ther* 2015;45(2):61-76. Epub 8 Jan 2015. doi:10.2519/jospt.2015.5723**Keyword:** decision support techniques, sensitivity, specificity

Fellowship and residency programs

RESEARCH REPORT

The Impact of Physical Therapy Residency or Fellowship Education on Clinical Outcomes for Patients With Musculoskeletal Conditions

Authors: Jason Rodeghero, PT, PhD^{1,2,5}, Ying-Chih Wang, OT, PhD^{3,4}, Timothy Flynn, PT, PhD^{1,5}, Joshua A. Cleland, PT, PhD⁶, Robert S. Wainner, PT, PhD^{5,7,8}, Julie M. Whitman, PT, DSc^{5,8}

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2015, **Volume:** 45 **Issue:** 2 **Pages:** 86-96 doi:10.2519/jospt.2015.5255

Abstract

Study Design: A retrospective cohort design was conducted using data from an electronic survey and an existing commercial outcomes database.

Objective: To compare the clinical outcomes of patients with musculoskeletal conditions treated by physical therapists who had completed residency or fellowship programs versus those who had not.

Background: There is an increasing focus on specialization through postprofessional education in physical therapy residency and fellowship programs. Scant evidence exists that evaluates the influence of postprofessional clinical education on actual patient outcomes.

Methods: Physical therapists using a national outcomes database were surveyed to determine their level of postprofessional education. Survey responders were categorized into 1 of 3 groups that included no residency or fellowship training, residency trained, or fellowship trained. Outcomes for 25 843 patients with musculoskeletal conditions treated by 363 therapists from June 2012 to June 2013 were extracted from the database. These data were analyzed to identify any differences in functional status change and efficiency achieved between the 3 groups. Potentially confounding variables were controlled for statistically.

Results: The fellowship-trained group of physical therapists achieved functional status changes and efficiency that were greater than those of the other groups. No difference in functional status change was observed between the residency group and the therapists without residency or fellowship training. The group without residency or fellowship training was more efficient than the residency-trained group. Fellowship-trained therapists were more likely to achieve greater treatment effect sizes than therapists without residency or fellowship training. Residency-trained therapists were less likely to achieve greater treatment effect sizes than the therapists without residency or fellowship training.

Conclusion: These data demonstrate that fellowship training may contribute to statistically greater patient outcomes. Residency training did not appear to contribute to improved patient functional status change or efficiency. It is unknown whether the statistical differences observed would be clinically meaningful for patients. *J Orthop Sports Phys Ther* 2015;45(2):86-96. Epub 10 Jan 2015. doi:10.2519/jospt.2015.5255

Keyword: residency, fellowship, outcomes

NEUROMOBILIZATION

SLR and sural nerve

A modified straight leg raise test to differentiate between sural nerve pathology and Achilles tendinopathy. A cross-sectional cadaver study

Michel W. Coppieters (Prof.) Jennifer L. Crooke¹ Peter R. Lawrenson² Shin Jiun Khoo³ Terje Skulstad⁴ Yaheli Bet-Or

Manual Therapy , 02/02/2015

DOI: <http://dx.doi.org/10.1016/j.math.2015.01.013>

Abstract

Background: A modified straight leg raise test for the sural nerve (SLRSURAL) has been proposed to assist in the differential diagnosis of sural nerve pathology in people with posterior calf or ankle pain, or lateral foot pain. The biomechanical rationale is that strain in the dorsolateral ankle and foot structures following dorsiflexion-inversion can be selectively increased in the sural nerve with hip flexion. There are however no studies which have investigated whether hip flexion can increase strain in the sural nerve at the ankle.

Objectives: To measure strain and longitudinal excursion of the sural nerve and Achilles tendon during a modified SLR.

Design: Cross-sectional cadaver study, with a repeated-measures design.

Method: Strain and excursion were measured unilaterally in seven embalmed cadavers using differential transducers and a digital calliper. Data were analysed with repeated-measures ANOVAs ($p < 0.05$).

Results: With hip flexion (mean (SD): 54.6 (10.6) degrees), strain increased in the sural nerve (0.9 (0.5)%; $p = 0.008$), but not in the Achilles tendon (0.3 (0.3)%; $p = 0.16$). The sural nerve moved 1.0 (0.5) mm proximally with hip flexion ($p = 0.02$).

Conclusions: The load placed on the sciatic nerve following hip flexion is transmitted distally to the sural nerve. These findings provide biomechanical support for the SLRSURAL. The relatively small changes in strain and excursion were most likely due to limited available ankle mobility in the tested cadavers. Further research is required to establish the diagnostic accuracy of SLRSURAL in a clinical setting.

STRETCHING/MUSCLES

CR vs. passive stretching

Scand J Med Sci Sports. 2015 Jan 26. doi: 10.1111/sms.12399.

Effects of contract-relax vs static stretching on stretch-induced strength loss and length-tension relationship.

Balle SS¹, Magnusson SP, McHugh MP.

Author information

Abstract

The purpose of this study was to determine the acute effects of contract-relax stretching (CRS) vs static stretching (SS) on strength loss and the length-tension relationship. We hypothesized that there would be a greater muscle length-specific effect of CRS vs SS. Isometric hamstring strength was measured in 20 healthy people at four knee joint angles (90°, 70°, 50°, 30°) before and after stretching. One leg received SS, the contralateral received CRS. Both stretching techniques resulted in significant strength loss, which was most apparent at short muscle lengths [SS: P = 0.025; stretching × angle P < 0.001; 11.7% at 90° P < 0.01; 5.6% at 70° nonsignificant (ns); 1.3% at 50° ns; -3.7% at 30° ns. CRS: P < 0.001; stretching × angle P < 0.001; 17.7% at 90°, 13.4% at 70°, 11.4% at 50°, all P < 0.01, 4.3% at 30° ns]. The overall stretch-induced strength loss was greater (P = 0.015) after CRS (11.7%) vs SS (3.7%). The muscle length effect on strength loss was not different between CRS and SS (stretching × angle × stretching technique P = 0.43).

Contrary to the hypothesis, CRS did not result in a greater shift in the length-tension relationship, and in fact, resulted in greater overall strength loss compared with SS. These results support the use of SS for stretching the hamstrings.

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KEYWORDS: Stretch-induced strength loss; angle-torque relationship; hamstring muscle; knee flexion

PMID: 25622920

STM

Trigger points and HA

Clin J Pain. 2015 Feb;31(2):159-68. doi: 10.1097/AJP.0000000000000091.

Myofascial Trigger Point-focused Head and Neck Massage for Recurrent Tension-type Headache: A Randomized, Placebo-controlled Clinical Trial.

Moraska AF¹, Stenerson L, Butryn N, Krutsch JP, Schmiede SJ, Mann JD.

Author information

Abstract

OBJECTIVE:

Myofascial trigger points (MTrPs) are focal disruptions in the skeletal muscle that can refer pain to the head and reproduce the pain patterns of tension-type HA (TTH). The present study applied massage focused on MTrPs of patients with TTH in a placebo-controlled, clinical trial to assess efficacy on reducing headache (HA) pain.

METHODS:

Fifty-six patients with TTH were randomized to receive 12 massage or placebo (detuned ultrasound) sessions over 6 weeks, or to wait-list. Trigger point release massage focused on MTrPs in cervical musculature. HA pain (frequency, intensity, and duration) was recorded in a daily HA diary. Additional outcome measures included self-report of perceived clinical change in HA pain and pressure-pain threshold at MTrPs in the upper trapezius and suboccipital muscles.

RESULTS:

From diary recordings, group differences across time were detected in HA frequency ($P=0.026$), but not for intensity or duration. Post hoc analysis indicated that HA frequency decreased from baseline for both massage ($P<0.0003$) and placebo ($P=0.013$), but no difference was detected between massage and placebo. Patient report of perceived clinical change was greater reduction in HA pain for massage than placebo or wait-list groups ($P=0.002$). Pressure-pain threshold improved in all muscles tested for massage only (all P 's <0.002).

DISCUSSION:

Two findings from this study are apparent: (1) MTrPs are important components in the treatment of TTH, and (2) TTH, like other chronic conditions, is responsive to placebo. Clinical trials on HA that do not include a placebo group are at risk for overestimating the specific contribution from the active intervention.

PMID: 25329141

Tai Massage and pain

The efficacy of traditional thai massage for the treatment of chronic pain: A systematic review

Complementary Therapies in Clinical Practice , 02/06/2015 Review Article Clinical Article
Keeratitanont K, et al.

The purpose of this paper is to provide a systematic review of the research about the effects of TTM on pain intensity and other important outcomes in individuals with chronic pain. The TTM benefits of pain reduction appear to maintain for up to 15 weeks. Additional research is needed to identify the moderators, mediators and to determine the long-term benefits of TTM relative to control conditions.

Methods

- Authors performed a systematic review of the controlled trials of the effects of TTM, using the keywords “Traditional Thai massage” or “Thai massage” with the keyword “Chronic pain.”

Results

- Six research articles met the inclusion criteria.
- All of the studies found a pre-to post-treatment pain reductions, varying from 25% to 80% and was also associated with improvements in disability, perceived muscle tension, flexibility and anxiety

Kinesio tape and muscle facilitation

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 130–133

Kinesiology tape does not facilitate muscle performance: A deceptive controlled trial

K.Y. Poon S.M. Li M.G. Roper M.K.M. Wong O. Wong R.T.H. Cheung

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.013>

Abstract

Kinesiology tape (KinTape) is a therapeutic tape without much understanding of its mechanism. KinTape claims to increase cutaneous stimulation, which facilitates motor unit firing, and consequently improves functional performance; however these, benefits could be due to placebo effects. This study investigated the true effects of KinTape by a deceptive, randomized, and controlled trial. Thirty healthy participants performed isokinetic testing of three taping conditions: true facilitative KinTape, sham KinTape, and no KinTape. The participants were blindfolded during the evaluation. Under the pretense of applying adhesive muscle sensors, KinTape was applied to their quadriceps in the first two conditions. Normalized peak torque, normalized total work, and time to peak torque were measured at two angular speeds (60°/s and 180°/s) and analyzed with one-way repeated measures ANOVA. Participants were successfully deceived and they were ignorant about KinTape.

No significant differences were found between normalized peak torque, normalized total work, and time to peak torque at 60°/s or 180°/s ($p = 0.31–0.99$) between three taping conditions. The results showed that KinTape did not facilitate muscle performance in generating higher peak torque, yielding a greater total work, or inducing an earlier onset of peak torque. These findings suggest that previously reported muscle facilitatory effects using KinTape may be attributed to placebo effects.

Cervicogenic dizziness and Mulligan

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 148–156

Manual therapy for cervicogenic dizziness: Long-term outcomes of a randomised trial

Susan A. Reid Robin Callister Suzanne J. Snodgrass Michael G. Katekar Darren A. Rivett

DOI: <http://dx.doi.org/10.1016/j.math.2014.08.003>

Abstract

Manual therapy is effective for reducing cervicogenic dizziness, a disabling and persistent problem, in the short term. This study investigated the effects of sustained natural apophyseal glides (SNAGs) and passive joint mobilisations (PJM) on cervicogenic dizziness compared to a placebo at 12 months post-treatment. Eighty-six participants (mean age 62 years, standard deviation (SD) 12.7) with chronic cervicogenic dizziness were randomised to receive SNAGs with self-SNAGs ($n = 29$), PJMs with range-of-motion (ROM) exercises ($n = 29$), or a placebo ($n = 28$) for 2–6 sessions over 6 weeks. Outcome measures were dizziness intensity, dizziness frequency (rated between 0 [none] and 5 [$>$ once/day]), the Dizziness Handicap Inventory (DHI), pain intensity, head repositioning accuracy (HRA), cervical spine ROM, balance, and global perceived effect (GPE). At 12 months both manual therapy groups had less dizziness frequency (mean difference SNAGs vs placebo -0.7 , 95% confidence interval (CI) -1.3 , -0.2 , $p = 0.01$; PJMs vs placebo -0.7 , -1.2 , -0.1 , $p = 0.02$), lower DHI scores (mean difference SNAGs vs placebo -8.9 , 95% CI -16.3 , -1.6 , $p = 0.02$; PJMs vs placebo -13.6 , -20.8 , -6.4 , $p < 0.001$) and higher GPE compared to placebo, whereas there were no between-group differences in dizziness intensity, pain intensity or HRA.

There was greater ROM in all six directions for the SNAG group and in four directions for the PJM group compared to placebo, and small improvements in balance for the SNAG group compared to placebo. There were no adverse effects. These results provide evidence that both forms of manual therapy have long-term beneficial effects in the treatment of chronic cervicogenic dizziness.

Upper Traps pain and scapula position

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 124–129

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

Kuan-Ting Lee Chiung-Cheng Chuang Chien-Hung Lai Jing-Jhao Ye Chien-Lung Wu

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.014>

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 ($P < 0.05$).

Dry needling

J Back Musculoskelet Rehabil. 2014 Oct 15.

Efficacy of dry needling for treatment of myofascial pain syndrome.

Fogelman Y¹, Kent J².

Author information

Abstract

Myofascial pain is a major cause of musculoskeletal regional pain. Myofascial pain, which is a high-prevalence but eminently treatable condition, is almost universally underdiagnosed by physicians and undertreated by physical therapy modalities. Large numbers of patients can be left suffering in chronic pain for years. Dry needling, also referred to as Intramuscular Stimulation, is a method in the arsenal of pain management which has been known for almost 200 years in Western medicine, yet has been almost completely ignored. With the increase in research in this field over the past two decades, there are many high-quality studies that demonstrate dry needling to be an effective and safe method for the treatment of myofascial pain when diagnosed and treated by adequately-trained physicians or physical therapists.

This article provides an overview of recent literature regarding the treatment of myofascial pain syndrome, evidence for the efficacy of dry needling as a central component of its management, and a glimpse at developments in recent imaging methods to aid in the treatment of these problems.

KEYWORDS: Myofascial pain syndrome; dry needling; intramuscular stimulation; trigger point
PMID:25322743

Trigger points

J Manipulative Physiol Ther. 2015 Jan 20. pii: S0161-4754(14)00275-9. doi: 10.1016/j.jmpt.2014.12.005.

Evaluation of Palpation, Pressure Algometry, and Electromyography for Monitoring Trigger Points in Young Participants.

Wytrążek M¹, Huber J², Lipiec J³, Kulczyk A⁴.

Author information

Abstract

OBJECTIVE:

The aims of this study were to assess trigger points (TrPs), their pain threshold, and the activity of motor units in the neck and shoulder girdle muscles of young volunteers and to assess palpation, algometry, and surface electromyography (EMG) for their detection.

METHODS:

Seventy participants aged from 19 to 26 years (20.6 ± 1.4 years [mean \pm SD]) were examined to identify TrPs through palpation, an algometer test for pressure pain threshold (PPT), a test for the activity of muscle motor units at rest (rEMG) and at maximal contraction (mcEMG) with surface EMG recordings.

RESULTS:

Palpation studies revealed numerous symmetrical nonreferring latent TrPs (379/560 performed tests), referring latent TrPs (91/560), and few active TrPs (4/560). Algometry confirmed the lowest PPT in active TrPs and the highest PPT in participants with no TrPs (86/560). Pressure pain thresholds were lower in nonpregnant women than in men, especially in the trapezius and sternocleidomastoid muscles with nonreferring and referring latent TrPs. Trigger points evoked a moderate increase of rEMG amplitude but with no evident changes in mcEMG.

CONCLUSIONS:

This study showed that the preliminary algometry and rEMG recordings monitored a decrease in PPT and an increase in muscle tension in all cases of TrPs in each of the 3 types detected in people younger than 30 years.

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KEYWORDS:

Electromyography; Pain Measurement; Palpation; Trigger Points

PMID: 25616692

MUSCLES

Hamstring tears

Am J Sports Med. 2014 Nov 14. pii: 0363546514556638.

The Effect of Previous Hamstring Strain Injuries on the Change in Eccentric Hamstring Strength During Preseason Training in Elite Australian Footballers.

Opar DA¹, Williams MD², Timmins RG³, Hickey J⁴, Duhig SJ⁵, Shield AJ⁶.

Author information

Abstract

BACKGROUND: Hamstring strain injuries (HSIs) are the most common injury type in Australian football, and the rate of recurrence has been consistently high for a number of years. Long-lasting neuromuscular inhibition has been noted in previously injured athletes, but it is not known if this influences the athlete's adaptive response to training.

PURPOSE: To determine if elite Australian footballers with a prior unilateral HSI (previously injured group) display less improvement in eccentric hamstring strength during preseason training compared with athletes without a history of HSIs (control group).

STUDY DESIGN: Cohort study; Level of evidence, 2.

METHODS: A total of 99 elite Australian footballers (17 with a history of unilateral HSIs in the previous 12-month period) participated in this study. Eccentric hamstring strength was assessed at the start and end of preseason training using an instrumented Nordic hamstring device. The change in eccentric strength across the preseason was determined in absolute terms and normalized to the start of preseason strength. The start of preseason strength was used as a covariate to control for differences in starting strength.

RESULTS: The left and right limbs in the control group showed no difference in absolute or relative change (left limb: 60.7 ± 72.9 N and 1.28 ± 0.34 N, respectively; right limb: 48.6 ± 83.8 N and 1.24 ± 0.43 N, respectively). Similarly, the injured and uninjured limbs in the previously injured group showed no difference in either absolute or relative change (injured limb: 13.1 ± 57.7 N and 1.07 ± 0.18 N, respectively; uninjured limb: 14.7 ± 54.0 N and 1.07 ± 0.22 N, respectively). The previously injured group displayed significantly less increase in eccentric hamstring strength across the preseason (absolute change, 13.9 ± 55.0 N; relative change, 1.07 ± 0.20 N) compared with the control group (absolute change, 54.6 ± 78.5 N; relative change, 1.26 ± 0.39 N) for both absolute and relative measures ($P < .001$), even after controlling for differences in the start of preseason eccentric hamstring strength, which had a significant effect on strength improvement.

CONCLUSION: Elite Australian footballers with a unilateral history of HSIs displayed less improvement in eccentric hamstring strength across preseason training. The smaller improvements were not restricted to the previously injured limb as the contralateral limb also displayed similarly small improvements in eccentric strength. Whether this is the cause of or the result of an injury remains to be seen, but it has the potential to contribute to the risk of hamstring strain reinjuries.

KEYWORDS: Nordic hamstring exercise; eccentric strength; hamstring; muscle injury

PMID:25398244

Tendinopathy

Br J Sports Med. 2014 Dec 8. pii: bjsports-2014-093989. doi: 10.1136/bjsports-2014-093989.

Lipids, adiposity and tendinopathy: is there a mechanistic link? Critical review.

Scott A¹, Zwerver J², Grewal N¹, de Sa A¹, Alktebi T¹, Granville DJ³, Hart DA⁴.

Author information

Abstract

Being overweight or obese is associated with an elevated risk of tendon pathology. However, for sportspeople the epidemiological data linking weight or adiposity on one hand, and risk of tendon pathology on the other, are less consistent. Indeed, the mechanistic links between diet, adiposity and tendon pathology remain largely unexamined. Recent studies have begun to examine the effects of dietary interventions on outcomes such as tendon biomechanics or pain. Oxidised low-density lipoprotein has been shown to (A) accumulate in the tendon tissues of mice that eat a fatty diet and (B) induce a pathological phenotype in human tendon cells. This paper addresses the current debate: is excessive body mass index (causing increased load and strain on tendon tissue) per se the underlying mechanism? Or do local or systemic influences of fat on tendons predispose to tendon pathology? This narrative review argues that excessive blood lipids may be an important avenue for clinical investigations.

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KEYWORDS: Body composition; Fat; Injury; Overuse; Tendon

PMID:25488953

STRETCHING**Hamstring stretching**

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 134–137

The effect of hip rotation on shear elastic modulus of the medial and lateral hamstrings during stretching

Hiroki Umegaki Tome Ikezoe Masatoshi Nakamura Satoru Nishishita Takuya Kobayashi Kosuke Fujita Hiroki Tanaka Noriaki Ichihashi

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.016>

Abstract

Regarding hamstring stretching methods, many studies have investigated the effect of stretching duration or frequency on muscle stiffness. However, the most effective stretching positions for hamstrings are unclear because it is impossible to quantify muscle elongation directly and noninvasively *in vivo*. Recently, a new ultrasound technology, ultrasonic shear wave elastography, has permitted noninvasive and reliable measurement of muscle shear elastic modulus, which has a strong linear relationship to the amount of muscle elongation.

This study aimed to investigate the effect of hip internal and external rotation on shear elastic modulus of the lateral and medial hamstrings, respectively, during stretching *in vivo* using ultrasonic shear wave elastography. Twenty-three healthy men (age, 23.0 ± 2.1 years) were recruited for this study. To investigate the effect of hip rotation on the elongation of the medial and lateral hamstrings, shear elastic modulus of the biceps femoris (BF) and semitendinosus (ST) was measured at rest (a supine position with 90° knee flexion, 90° hip flexion, and hip neutral rotation) and in seven stretching positions (with 45° knee flexion and hip internal, external, and neutral rotation) using ultrasonic shear wave elastography. In both BF and ST, the shear elastic modulus in the rest position was significantly lower than that in all stretching positions.

However, no significant differences were seen among stretching positions. Our results suggest that adding hip rotation at a stretching position for the hamstrings may not have a significant effect on muscle elongation of the medial and lateral hamstrings.

MOTOR CONTROL**Motor control for LBP****RESEARCH REPORT**

Individualized Low-Load Motor Control Exercises and Education Versus a High-Load Lifting Exercise and Education to Improve Activity, Pain Intensity, and Physical Performance in Patients With Low Back Pain: A Randomized Controlled Trial

Authors: Björn Aasa, RPT, MaSci^{1,2}, Lars Berglund, RPT, MaSci^{2,3}, Peter Michaelson, RPT, PhD⁴, Ulrika Aasa, RPT, PhD³

Abstract

Study Design: Randomized controlled trial.

Background: Low back pain is a common disorder. Patients with low back pain frequently have aberrant and pain-provocative movement patterns that often are addressed with motor control exercises.

Objective: To compare the effects of low-load motor control (LMC) exercise and those of a high-load lifting (HLL) exercise.

Methods: Seventy participants with recurrent low back pain, who were diagnosed with nociceptive mechanical pain as their dominating pain pattern, were randomized to either LMC or HLL exercise treatments. Participants were offered 12 treatment sessions over an 8-week period. All participants were also provided with education regarding pain mechanisms.

Methods: Participants were assessed prior to and following treatment. The primary outcome measures were activity (the Patient-Specific Functional Scale) and average pain intensity over the last 7 days (visual analog scale). The secondary outcome measure was a physical performance test battery that included 1 strength, 3 endurance, and 7 movement control tests for the lumbopelvic region.

Results: Both interventions resulted in significant within-group improvements in pain intensity, strength, and endurance. The LMC group showed significantly greater improvement on the Patient-Specific Functional Scale (4.2 points) compared with the HLL group (2.5 points) ($P < .001$). There were no significant between-group differences in pain intensity ($P = .505$), strength, and 1 of the 3 endurance tests. However, the LMC group showed an increase (from 2.9 to 5.9) on the movement control test subscale, whereas the HLL group showed no change (from 3.9 to 3.1) ($P < .001$).

Conclusion: An LMC intervention may result in superior outcomes in activity, movement control, and muscle endurance compared to an HLL intervention, but not in pain intensity, strength, or endurance. Registered at ClinicalTrials.gov (NCT01061632).

Level of Evidence: Therapy, level 2b-. *J Orthop Sports Phys Ther* 2015;45(2):77–85.
doi:10.2519/jospt.2015.5021

Keyword: deadlift, functional rehabilitation, motor learning, stabilization exercises, subgrouping

CFS/BET

Activity and sitting

Mortality benefits for replacing sitting time with different physical activities

Medicine and Science in Sports and Exercise, 01/29/2015 Clinical Article
Matthews CE, et al

Abstract

Purpose: Prolonged sitting has emerged as a risk factor for early mortality, but the extent of benefit realized by replacing sitting time with exercise, or activities of everyday living (i.e. non-exercise activities), is not known.

Methods: We prospectively followed 154,614 older adults (59-82 years) in the NIH-AARP Diet and Health Study who reported no major chronic diseases at baseline and reported detailed information about sitting time, exercise, non-exercise activities. Proportional hazards models were used to estimate adjusted hazard ratios and 95% confidence intervals (HR [95%CI]) for mortality. An isotemporal modeling approach was used to estimate associations for replacing sitting time with specific types of physical activity, with separate models fit for less active and more active participants to account for non-linear associations.

Results: During 6.8 (SD=1.0) years of follow-up 12,201 deaths occurred. Greater sitting time (≥ 12 vs. < 5 hrs/d) was associated with increased risk for all-cause and cardiovascular mortality. In less active adults (< 2 hrs/d total activity), replacing one hour of sitting per day with an equal amount of activity was associated with lower all-cause mortality for both exercise (HR=0.58 [0.54,0.63]) and non-exercise activities (HR=0.70 [0.66,0.74]), including household chores, lawn and garden work, and daily walking. Among more active participants (≥ 2 hrs/d total activity) replacement of sitting time with purposeful exercise was associated with lower mortality (HR=0.91 [0.88-0.94]), but not with non-exercise activity (HR=1.00 [0.98-1.02]). Similar results were noted for cardiovascular mortality.

Conclusions: Physical activity intervention strategies for older adults often focus on aerobic exercise, but our findings suggest that reducing sitting time and engaging in a variety of activities is also important, particularly for inactive adults.

EXERCISE**Exercise program**

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 56–62

Tailored exercise program reduces symptoms of upper limb work-related musculoskeletal disorders in a group of metalworkers: A randomized controlled trial

Chiara Rasotto¹ Marco Bergamin¹ Alberto Simonetti Stefano Maso Giovanni B. Bartolucci
Andrea Ermolao Marco Zaccaria

DOI: <http://dx.doi.org/10.1016/j.math.2014.06.007>

Abstract

Work-related musculoskeletal disorders (WRMDs) are a leading cause of work-related disability and loss of productivity in the developed countries; these disorders may concur with the indirect costs of an illness or injury included losses of potential output. Literature on workplace physical activity program provided a mixed but positive impact on health and important worksite outcomes. Therefore, programs of physical activity organized and performed in the workplace could reveal as essential tool to reduce musculoskeletal symptoms.

This investigation aimed to assess the effectiveness of a tailored physical activity program, performed in a work-environment, to reduce the symptoms in upper extremities and neck with the novelty in personalizing the approach applied to the exercise protocol, basing on pain and disability levels, to reduce the onset and symptoms in upper extremity and neck WRMDs increasing upper-limb strength and flexibility.

68 metalworkers were recruited, 34 were randomly allocated to an intervention group (IG), while the other 34 to a control group. Primary outcomes concerned pain symptoms measured with visual analog scales while disability was measured by DASH (Disability of the Arm, Shoulder and Hand), and NPDS-I (Neck Pain and Disability Scale) questionnaires. Grip strength, upper-limb mobility, neck and shoulder range of motion were also assessed.

After the 9-month intervention, IG reduced pain symptoms on neck, shoulders, elbows and on wrists. Grip strength and upper-limb mobility improved as well as scores on questionnaires. This protocol suggests that performing a tailored physical activity program is beneficial to reduce pain and disability on upper-limb WRMDs.

Pain science and exercise

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 216–220

Exercise therapy for chronic musculoskeletal pain: Innovation by altering pain memories

Jo Nijs Enrique Lluch Girbés Mari Lundberg Anneleen Malfliet

Abstract

Even though nociceptive pathology has often long subsided, the brain of patients with chronic musculoskeletal pain has typically acquired a protective (movement-related) pain memory. Exercise therapy for patients with chronic musculoskeletal pain is often hampered by such pain memories. Here the authors explain how musculoskeletal therapists can alter pain memories in patients with chronic musculoskeletal pain, by integrating pain neuroscience education with exercise interventions. The latter includes applying graded exposure in vivo principles during exercise therapy, for targeting the brain circuitries orchestrated by the amygdala (the memory of fear centre in the brain).

Before initiating exercise therapy, a preparatory phase of intensive pain neuroscience education is required. Next, exercise therapy can address movement-related pain memories by applying the ‘exposure without danger’ principle.

By addressing patients' perceptions about exercises, therapists should try to decrease the anticipated danger (threat level) of the exercises by challenging the nature of, and reasoning behind their fears, assuring the safety of the exercises, and increasing confidence in a successful accomplishment of the exercise. This way, exercise therapy accounts for the current understanding of pain neuroscience, including the mechanisms of central sensitization.

Muscle hypertrophy

Sports Med. 2015 Jan 20.

Effect of Repetition Duration During Resistance Training on Muscle Hypertrophy: A Systematic Review and Meta-Analysis.

Schoenfeld BJ¹, Ogborn DI, Krieger JW.

Author information

Abstract

BACKGROUND:

Maximizing the hypertrophic response to resistance training (RT) is thought to be best achieved by proper manipulation of exercise program variables including exercise selection, exercise order, length of rest intervals, intensity of maximal load, and training volume. An often overlooked variable that also may impact muscle growth is repetition duration. Duration amounts to the sum total of the concentric, eccentric, and isometric components of a repetition, and is predicated on the tempo at which the repetition is performed.

OBJECTIVE:

We conducted a systematic review and meta-analysis to determine whether alterations in repetition duration can amplify the hypertrophic response to RT.

METHODS:

Studies were deemed eligible for inclusion if they met the following criteria: (1) were an experimental trial published in an English-language refereed journal; (2) directly compared different training tempos in dynamic exercise using both concentric and eccentric repetitions; (3) measured morphologic changes via biopsy, imaging, and/or densitometry; (4) had a minimum duration of 6 weeks; (5) carried out training to muscle failure, defined as the inability to complete another concentric repetition while maintaining proper form; and (6) used human subjects who did not have a chronic disease or injury. A total of eight studies were identified that investigated repetition duration in accordance with the criteria outlined.

RESULTS:

Results indicate that hypertrophic outcomes are similar when training with repetition durations ranging from 0.5 to 8 s.

CONCLUSIONS:

From a practical standpoint it would seem that a fairly wide range of repetition durations can be employed if the primary goal is to maximize muscle growth. Findings suggest that training at volitionally very slow durations (>10s per repetition) is inferior from a hypertrophy standpoint, although a lack of controlled studies on the topic makes it difficult to draw definitive conclusions.

PMID:25601394

Hip abductor strengthening

Differentiation of gluteus medius and minimus activity in weight bearing and non-weight bearing exercises by M-mode ultrasound imaging

A. Dieterich, F. Petzke, C. Pickard P. Davey D. Falla

Manual Therapy , 02/02/2015

Background

Knowledge on task-specific activity of the deep hip abductor muscles is limited and is required for determining appropriate hip abductor exercises.

Objectives

To assess the temporal differentiation of activity of gluteus minimus and the deep and the superficial regions of gluteus medius during weight bearing and non-weight bearing exercises.

Design

Repeated measures design on a single recording occasion.

Method

M-mode ultrasound was used to capture activity-related muscle motion of the gluteus minimus and medius muscles in 20 healthy volunteers during weight shift, hip hitch, side-lying abduction and active leg lengthening exercises. M-mode traces were computer-processed for detecting muscle motion onsets. Mean onset differences between muscle regions and their intra-individual variability were assessed.

Results

In contrast to side-lying abduction, the weight shift and hip hitch exercises resulted in larger onset variability between the gluteus minimus and deep gluteus medius ($P < 0.001$) and also between the deep and superficial regions of the gluteus medius ($P < 0.05$).

Conclusions

Weight bearing exercises promoted a greater functional differentiation between deep and superficial hip abductor muscles

Keywords:

Hip, ultrasound, variability, therapeutic exercise

CORE

TA size

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 117–123

Lateral abdominal muscle size at rest and during abdominal drawing-in manoeuvre in healthy adolescents

Pawel Linek Edward Saulicz Tomasz Wolny Andrzej Myśliwiec Mirosław Kokosz

DOI: <http://dx.doi.org/10.1016/j.math.2014.07.009>

Abstract

Lateral abdominal wall muscles in children and adolescents have not been characterised to date. In the present report, we examined the reliability of the ultrasound measurement and thickness of the oblique external muscle (OE), oblique internal muscle (OI) and transverse abdominal muscle (TrA) at rest and during abdominal drawing-in manoeuvre (ADIM) on both sides of the body in healthy adolescents. We also determined possible differences between boys and girls and defined any factors—such as body mass, height and BMI—that may affect the thickness of the abdominal muscles. B-mode ultrasound was used to assess OE, OI and TrA on both sides of the body in the supine position. Ultrasound measurements at rest and during ADIM were reliable in this age group ($ICC_{3,3} > 0.92$). OI was always the thickest and TrA the thinnest muscle on both sides of the body. In this group, an identical pattern of the contribution of the individual muscles to the structure of the lateral abdominal wall ($OI > OE > TrA$) was observed.

At rest and during ADIM, no statistically significant side-to-side differences were demonstrated in either gender. The body mass constitutes between 30% and <50% of the thickness differences in all muscles under examination at rest and during ADIM. The structure of lateral abdominal wall in adolescents is similar to that of adults. During ADIM, the abdominal muscles in adolescents react similarly to those in adults. This study provided extensive information regarding the structure of the lateral abdominal wall in healthy adolescents.

Muscle size

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 90–95

Age and side-related morphometric MRI evaluation of trunk muscles in people without back pain

Stephanie Valentin Theresia Licka James Elliott

Highlights

- Side-differences in muscle volume were found only in the mature group.
- Height significantly increases volume of all muscles investigated.
- Muscle volume significantly increased with BMI in the extensors only.
- Multifidus muscle volume decreased with age.
- With age, but not with BMI, fat increased in the right extensor muscles.

Abstract

This study evaluated lumbar spine muscle volume and Muscle Fatty Infiltrate (MFI) across two age groups of healthy adults. Twenty-four participants (young group – YG: age 18–25, $n = 12$; mature group – MG: age 45–60, $n = 12$) without low back pain underwent T1-weighted axial MRI. Muscle volume and MFI were obtained from the left and right lumbar erector spinae (ES), multifidus (M), rectus abdominis (RA) and psoas (PS) muscles. For MFI, mean pixel intensity (MPI) of muscles was reported as a percentage of subcutaneous fat MPI. Within-group comparison of left and right side muscle volume was not significantly different in the YG. In the MG, right RA and ES were significantly smaller than left (RA $p = 0.049$; ES $p = 0.03$). In both groups, left PS, M and ES MFI was significantly smaller compared to the right side and left RA MFI was significantly greater compared to right side (all $p \leq 0.001$). For M volume, 81.7–84.6% of variance was explained by age, height and Body Mass Index (BMI). For ES volume, 81.6–82.8% of variance was explained by height and BMI. Age explained 18.1%–36.0% of variance in M and ES right MFI.

Therefore, age and BMI are relevant factors for extensor muscle volume, but not for flexor muscle volume. Also, age significantly influences MFI for right-sided extensors only. The age effect is apparently independent of full subjective back functionality. For future spinal muscle research, the side-and muscle-specific effect of age on muscle morphology should be considered.

POSTURE

Lordosis and LBP in standing

Man Ther. 2015 Jan 14. pii: S1356-689X(15)00002-8. doi: 10.1016/j.math.2015.01.001.

Is lumbar lordosis related to low back pain development during prolonged standing?

Sorensen CJ¹, Norton BJ², Callaghan JP³, Hwang CT⁴, Van Dillen LR⁵.

Author information

Abstract

BACKGROUND:

An induced-pain paradigm has been used in back-healthy people to understand risk factors for developing low back pain during prolonged standing.

OBJECTIVES:

The purposes of this study were to (1) compare baseline lumbar lordosis in back-healthy participants who do (Pain Developers) and do not (Non-Pain Developers) develop low back pain during 2 h of standing, and (2) examine the relationship between lumbar lordosis and low back pain intensity.

DESIGN:

Cross-sectional.

METHOD:

First, participants stood while positions of markers placed superficial to the lumbar vertebrae were recorded using a motion capture system. Following collection of marker positions, participants stood for 2 h while performing light work tasks. At baseline and every 15 min during standing, participants rated their low back pain intensity on a visual analog scale. Lumbar lordosis was calculated using marker positions collected prior to the 2 h standing period. Lumbar lordosis was compared between pain developers and non-pain developers. In pain developers, the relationship between lumbar lordosis and maximum pain was examined.

RESULTS/FINDINGS:

There were 24 (42%) pain developers and 33 (58%) non-pain developers. Lumbar lordosis was significantly larger in pain developers compared to non-pain developers (Mean difference = 4.4°; 95% Confidence Interval = 0.9° to 7.8°, Cohen's d = 0.7). The correlation coefficient between lumbar lordosis and maximum pain was 0.46 (P = 0.02).

CONCLUSION:

The results suggest that standing in more lumbar lordosis may be a risk factor for low back pain development during prolonged periods of standing. Identifying risk factors for low back pain development can inform preventative and early intervention strategies.

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KEYWORDS: Induced-pain paradigm; Low back pain; Lumbar lordosis; Prolonged standing

PMID: 25637464

SCOLIOSIS

Sacral slant

Spine J. 2015 Jan 20. pii: S1529-9430(15)00039-X. doi: 10.1016/j.spinee.2015.01.023.

The clinical importance of sacral slanting in patients with adolescent idiopathic scoliosis undergoing surgery.

Lee CS¹, Ha JK¹, Kim DG¹, Kim H², Hwang CJ¹, Lee DH¹, Cho JH³.

Author information

Abstract

BACKGROUND CONTEXT:

The phenomenon of sacral slanting has not been assessed in patients with AIS. It could be important in determining distal fusion level.

PURPOSE:

The purpose of this study is to clarify sacral slanting and to reveal frequency, character and clinical importance of sacral slanting in AIS patients who underwent surgery.

STUDY DESIGN/SETTING:

Retrospective review of radiographs PATIENT SAMPLE: The study included 389 patients who underwent surgery for AIS at a single center.

OUTCOME MEASURES:

Slanted angles of sacrum, distal curve types and postoperative decompensation were assessed in whole spine anteroposterior (AP) radiographs.

METHODS:

This was retrospective case series which included 389 adolescent idiopathic scoliosis (AIS) patients who underwent corrective surgeries. The degree of sacral slanting was defined as the angle between the horizontal line and the upper endplate of the sacrum. Distal curves were classified according to the direction of L4 tilt (L4-L type and L4-R type). The frequency, direction and relationship with curve types were analyzed descriptively. Postoperative changes of sacral slanting were compared by paired t-test. Decompensation by distal fusion level and distal curve types was analyzed descriptively. The P value of less than 0.05 was considered as statistically significant.

RESULTS:

The frequency of sacral slanting was 19.5% (76/389), 29.6% (115/389), and 40.6% (158/389) by using criteria of 5°, 4°, and 3° respectively. The 86.7% showed sacral slanting on the left side. The combination of L4-L type with left-sided sacral slanting was the most frequent (124/158, 78.7%). Slanted angles were decreased in some cases following surgery. Decompensation in the coronal plane was observed in 2 of 22 patients (9.1%) with a distal fusion level of L4, but in none of the 70 patients with a distal fusion level of L3.

CONCLUSIONS:

Sacral slanting in AIS patients is a unique and frequently observed finding that has never been researched to date. Most importantly, sacral slanting is a critical consideration in selecting distal fusion level when planning corrective surgery in patients with AIS.

KEYWORDS: adolescent idiopathic scoliosis; decompensation; distal fusion level; sacrum; slanting

PMID: 25615845

Exercise impact

Effect of exercise therapy on mild idiopathic scoliosis. Preliminary results

European Journal of Physical and Rehabilitation Medicine, 01/28/2015

Ferraro C., Masiero S., Venturin A., Pigatto M., Migliorino N.

Orthopaedic Rehabilitation Unit, Institute of Orthopaedics, University of Padua, Italy

OBJECTIVE: The aim of this paper was to test the efficacy of exercise therapy in modifying the evolution of the deformity in children with mild idiopathic scoliosis.

METHODS: We recruited 34 consecutive scoliotic subjects (mean age 11.6 years, range 8.7-14.1 years) with an initial mean Cobb angle of 14.9° and a mean hump height of 7.3 mm. They were assigned to one of two physical therapists who used different techniques with the same therapeutic goals (active postural correction of scoliosis). Subjects were asked to continue their exercises at home for at least 30 minutes a day. Thus, most of the exercise programme was carried out in the home. After a mean of 2 years of a) treatment, we performed a multiple linear regression analysis for the changes in Cobb angle as a function of a) the actual involvement in the home programme (minutes per day), b) the physical therapist variable, and c) the potentially confounding variables (such as initial Cobb angle and age, Risser sign and duration of the treatment). A simple linear regression analysis was performed for the changes in hump height as a function of the level of participation.

RESULTS: Results showed that maximal participation in exercise therapy (≥ 30 min/day) for the mean duration of 2 years, as compared to minimal participation (< 10 min/day), slowed down and even halted the progression of the deformity (curve and hump). Results did not differ significantly between the 2 therapists' groups.

CONCLUSION: If followed rigorously, an accurate exercise programme appears to effectively limit the worsening of deformity in mild scoliosis.

ATHLETICS

Hockey players and hip problems

J Sport Rehabil. 2015 Jan 22.

Investigating Strength and Range of Motion of the Hip Complex in Ice Hockey Athletes.

Wilcox CR¹, Osgood CT, White HS, Vince RV.

Author information

Abstract

CONTEXT:

Ice hockey athletes frequently injure the hip complex via a non-contact mechanism. We investigated patterns of strength and range of motion (ROM) to establish major differences compared to soccer athletes. Soccer athletes were compared to ice hockey athletes due to similarities between the two sports with regards to the intermittent nature and high number of lower limb injuries.

OBJECTIVE:

To compare the differences in ROM and strength of the hip for both the dominant (Dom) and non-dominant (Ndom) limb in ice hockey and soccer athletes.

DESIGN:

Case control study.

SETTING:

Bilateral ROM in hip flexion in sitting (FS) and lying (FL), extension, abduction, adduction, and internal rotation (IR) and external rotation (ER) was measured using a goniometer and assessed for strength using a hand held dynamometer on both the Dom and Ndom limbs. Participants. Twenty four male, active, uninjured NCAA division III ice hockey (16) and soccer (8) athletes.

MAIN OUTCOME MEASURE:

ROM and strength for hip FS, FL extension, abduction, adduction, IR and ER. A mixed model ANOVA was used to investigate interactions and main effects.

RESULTS:

Ice hockey athletes exhibited greater hip adduction ROM compared to soccer athletes in the Dom leg (both $p=0.002$) and when both limbs were combined ($p = 0.010$). Ice hockey athletes had less ROM in ER ($p = 0.042$) than soccer athletes. Ice hockey athletes displayed less strength in adduction in their Ndom leg compared to their Dom leg ($p=0.02$) along with less adduction than soccer players in their Ndom leg ($p=0.40$). Ice hockey athletes displayed less strength in hip adduction ($p=0.030$), FS ($p=0.023$) and FL ($p=0.030$) than soccer athletes.

CONCLUSIONS:

Our findings suggest that ice hockey athletes may present an 'at risk' profile for non-contact hip injuries, in comparison with soccer athletes with regards to strength and ROM of the hip.

PMID:25611955

GAIT**IT band symptoms and mechanics of gait**

Scand J Med Sci Sports. 2015 Jan 26. doi: 10.1111/sms.12394.

Gender differences in gait kinematics in runners with iliotibial band syndrome.

Phinyomark A¹, Osis S, Hettinga BA, Leigh R, Ferber R.

Author information

Abstract

Atypical running gait biomechanics are considered a primary factor in the etiology of iliotibial band syndrome (ITBS). However, a general consensus on the underpinning kinematic differences between runners with and without ITBS is yet to be reached. This lack of consensus may be due in part to three issues: gender differences in gait mechanics, the preselection of discrete biomechanical variables, and/or relatively small sample sizes. Therefore, this study was designed to address two purposes: (a) examining differences in gait kinematics for male and female runners experiencing ITBS at the time of testing and (b) assessing differences in gait kinematics between healthy gender- and age-matched runners as compared with their ITBS counterparts using waveform analysis. Ninety-six runners participated in this study: 48 ITBS and 48 healthy runners.

The results show that female ITBS runners exhibited significantly greater hip external rotation compared with male ITBS and female healthy runners. On the contrary, male ITBS runners exhibited significantly greater ankle internal rotation compared with healthy males. These results suggest that care should be taken to account for gender when investigating the biomechanical etiology of ITBS.

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KEYWORDS: Sex differences; gait biomechanics; lateral knee pain; overuse injuries

PMID: 25622800

Knee pain and gait speed

Geriatr Gerontol Int. 2015 Jan 22. doi: 10.1111/ggi.12432.

Association between knee pain and gait speed decline in rural Japanese community-dwelling older adults: 1-year prospective cohort study.

Kitayuguchi J¹, Kamada M, Hamano T, Nabika T, Shiwaku K, Kamioka H, Okada S, Mutoh Y.

Author information

Abstract

AIM:

The present study examined whether knee pain was associated with decline in maximum gait speed (MGS) in a rural mountainous region.

METHODS:

This was a population-based 1-year prospective cohort study. A total of 658 men and women aged 60 years and older participated in the baseline survey in 2006, and 400 individuals participated in the follow-up survey in 2007. We compared the incidence of meaningful decline in gait speed (≥ 0.1 m/s) in older adults with different knee pain levels (none, mild, severe), estimating incidence rate ratio (IRR) by multivariable-adjusted Poisson regression model.

RESULTS:

Meaningful decline in MGS presented in 24.3% of participants, especially in men (30.3%). Baseline knee pain level was significantly related to meaningful decline in MGS after adjustment of potential confounders (IRR 1.79 for mild pain, 1.84 for severe pain; P for trend < 0.01). In sensitivity analyses with change in MGS as the continuous variable, the association was not significant, but a similar negative association with knee pain was confirmed (mild pain $\beta = -0.040$, severe pain $\beta = -0.088$; P for trend = 0.104). In addition, older adults with knee pain at both baseline and follow up had a higher risk of meaningful decline in MGS (IRR 2.33, 95% CI 1.59-3.40) compared with those who had no pain at baseline or follow up.

CONCLUSIONS:

Knee pain was associated with a decline in gait speed at 1-year follow up. Prevention and treatment of knee pain might be important for suppression of decline in physical function in older adults.

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KEYWORDS: Japan; community-dwelling older adults; knee pain; maximum gait speed

PMID: 25611950

Posture and gait

Manual Therapy **February 2015** Volume 20, Issue 1, Pages 176–182

Effect of posture on hip angles and moments during gait

Cara L. Lewis   Shirley A. Sahrman

Abstract

Anterior hip pain is common in young, active adults. Clinically, we have noted that patients with anterior hip pain often walk in a swayback posture, and that their pain is reduced when the posture is corrected. The purpose of this study was to investigate a potential mechanism for the reduction in pain by testing the effect of posture on movement patterns and internal moments during gait in healthy subjects. Fifteen subjects were instructed to walk while maintaining three postures: 1) natural, 2) swayback, and 3) forward flexed. Kinematic and force data were collected using a motion capture system and a force plate. Walking in the swayback posture resulted in a higher peak hip extension angle, hip flexor moment and hip flexion angular impulse compared to natural posture.

In contrast, walking in a forward flexed posture resulted in a decreased hip extension angle and decreased hip flexion angular impulse. Based on these results, walking in a swayback posture may result in increased forces required of the anterior hip structures, potentially contributing to anterior hip pain. This study provides a potential biomechanical mechanism for clinical observations that posture correction in patients with hip pain is beneficial.

RUNNING

Patella Femoral pain

Scand J Med Sci Sports. 2015 Jan 14. doi: 10.1111/sms.12383.

Influence of step length and landing pattern on patellofemoral joint kinetics during running.

Willson JD¹, Ratcliff OM, Meardon SA, Willy RW.

Author information**Abstract**

Elevated patellofemoral joint kinetics during running may contribute to patellofemoral joint symptoms. The purpose of this study was to test for independent effects of foot strike pattern and step length on patellofemoral joint kinetics while running. Effects were tested relative to individual steps and also taking into account the number of steps required to run a kilometer with each step length. Patellofemoral joint reaction force and stress were estimated in 20 participants running at their preferred speed. Participants ran using a forefoot strike and rearfoot strike pattern during three different step length conditions: preferred step length, long (+10%) step length, and short (-10%) step length. Patellofemoral kinetics was estimated using a biomechanical model of the patellofemoral joint that accounted for cocontraction of the knee flexors and extensors.

We observed independent effects of foot strike pattern and step length. Patellofemoral joint kinetics per step was 10-13% less during forefoot strike conditions and 15-20% less with a shortened step length. Patellofemoral joint kinetics per kilometer decreased 12-13% using a forefoot strike pattern and 9-12% with a shortened step length. To the extent that patellofemoral joint kinetics contribute to symptoms among runners, these running modifications may be advisable for runners with patellofemoral pain.

KEYWORDS: Patellofemoral joint stress; cadence; foot strike; running training

PMID: 25585589

PAIN

Fascial pain and anxiety

Observer trait anxiety is associated with response bias to patient facial pain expression independent of pain catastrophizing

Pain Research and Management, 02/06/2015 Rash JA, et al.

In this study, authors want to examine the hypothesis that individuals who score high in trait anxiety would perceive more intense pain in others, as indicated by a larger negative response bias, and that this association would persist after adjusting for pain catastrophizing. Individuals scoring higher on trait anxiety were more likely to impute pain to a sufferer. Anxious caregivers may be better able to respond with appropriate intervention once pain behaviour is detected, or they may exacerbate symptoms by engaging in excessive palliative care and solicitous behaviour.

Methods

Healthy young adult participants (n=99; 50 male) watched videos containing excerpts of facial expressions taken from patients with shoulder pain and were asked to rate how much pain the patient was experiencing using an 11-point numerical rating scale. Sensitivity and response bias were calculated using signal detection methods.

Results

Trait anxiety was a predictor of response bias after statistically adjusting for pain catastrophizing and observer sex.

More anxious individuals had a proclivity toward imputing greater pain to a sufferer.

Pain drawings

Eur J Pain. 2015 Jan 6. doi: 10.1002/ejp.636.

Test-retest reliability of pain extent and pain location using a novel method for pain drawing analysis.

Barbero M¹, Moresi F, Leoni D, Gatti R, Egloff M, Falla D.

Author information

Abstract

BACKGROUND:

Pain drawings (PDs) are an important component of the assessment of a patient with pain. The aim of this work is to present the test-retest reliability of a novel method of quantifying the extent and location of pain. Additionally, the association between PD variables and clinical features in patients with chronic neck pain (CNP) and chronic low back pain (CLBP) was explored.

METHODS:

Fifty-one patients with CLBP and 56 patients with CNP participated. Each patient shaded two consecutive PDs using a digital tablet. Software was developed to quantify the pain extent, to analyse the pain overlap between PDs and to produce pain frequency maps. Correlations were obtained between pain extent and clinical features including the level of pain intensity, disability, and psychological distress and cognitive function.

RESULTS:

The intraclass correlation coefficients for pain extent in CLBP and CNP were very high: 0.97 (95% CI: 0.95-0.98) and 0.92 (95% CI: 0.87-0.98), respectively. The Bland Altman showed a mean difference close to zero: 5.4% pixels in CNP group and 3% pixels in the CLBP group. Significant correlations were observed between pain extent and pain intensity in CLBP and CNP and pain extent and disability in CNP. There was no relation between pain extent and the level of distress or cognitive function.

CONCLUSIONS:

A novel method for the acquisition of PD was presented. Test-retest reliability of reporting pain extent and pain location was supported in people with CNP and CLBP. Future research is needed to establish psychometric properties of PD.

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PMID:25565607

Post surgical pain

Clin J Pain. 2015 Jan 6.

Prevalence and Predictive Factors of Chronic Postsurgical Pain and Poor Global Recovery One Year after Outpatient Surgery.

Hoofwijk DM¹, Fiddellers AA, Peters ML, Stessel B, Kessels AG, Joosten EA, Gramke HF, Marcus MA.

Author information

Abstract

OBJECTIVES:

To prospectively describe the prevalence and predictive factors of chronic postsurgical pain (CPSP) and poor global recovery in a large outpatient population at a university hospital, one year after outpatient surgery.

METHODS:

A prospective longitudinal cohort study was performed. During eighteen months, patients presenting for preoperative assessment were invited to participate. Outcome parameters were measured by using questionnaires at three time points: one week preoperatively, four days postoperatively and one year postoperatively. A value of >3 on an 11-point numeric rating scale (NRS) was considered to indicate moderate to severe pain. A score of ≤80% on the Global Surgical Recovery Index (GSR) was defined as poor global recovery.

RESULTS:

908 patients were included. The prevalence of moderate to severe preoperative pain was 37.7%, acute postsurgical pain 26.7%, and CPSP 15.3%. Risk factors for the development of CPSP were surgical specialty, preoperative pain, preoperative analgesic use, acute postoperative pain, surgical fear, lack of optimism and poor preoperative quality of life. The prevalence of poor global recovery was 22.3%. Risk factors for poor global recovery were recurrent surgery because of the same pathology, preoperative pain, preoperative analgesic use, surgical fear, lack of optimism, poor preoperative and acute postoperative quality of life, and follow-up surgery during the first postoperative year.

DISCUSSION:

Moderate to severe CPSP after outpatient surgery is common, and should not be underestimated. Patients at risk for developing CPSP can be identified during the preoperative phase.

PMID: 25565589

Temporal summation of pain

Pre-surgical assessment of temporal summation of pain predicts the development of chronic postoperative pain 12 months after total knee replacement.

Pain. 2015 Jan;156(1):55-61

Distractions and pain

Randomized controlled trial to compare the effect of simple distraction interventions on pain and anxiety experienced during conscious surgery

European Journal of Pain, 02/02/2015 Clinical Article

Hudson BF, et al. – This prospective, non-blinded randomized controlled trial aimed to compare the effectiveness of four intraoperative distraction interventions for anxiety and pain management during minimally invasive venous surgery under local anaesthetic. The use of simple intraoperative distraction techniques, particularly interacting with nurses, using stress balls or watching a DVD during surgery conducted under local anaesthetic can significantly improve patients' experiences.

Methods

- 407 patients presenting with varicose veins at a private clinic, were randomized to one of four intraoperative distraction interventions or treatment as usual.
- All participants received endovenous thermoablation and/or phlebectomies of varicose veins.
- After losses to follow-up, 398 participants were entered into the analysis.
- Participants were randomly allocated to one of the following intraoperative distraction techniques: patient selected music (n = 85), patient selected DVD (n = 85), interaction with nurses (n = 81), touch (stress balls) (n = 80) or treatment as usual (TAU, n = 76).
- The state scale of the STAI, the Short-form McGill pain questionnaire and numeric rating scales were used to assess intraoperative pain and anxiety.

Results

- Intraoperative anxiety ratings were significantly lower when participants interacted with nurses, used stress balls or watched a DVD during surgery compared to treatment as usual.
- Intraoperative pain ratings were significantly lower than treatment as usual when participants interacted with nurses or used stress balls during surgery.
- Patients' satisfaction was not significantly impacted by intraoperative distractions.

COMPLEX REGIONAL PAIN**Cold CRP syndrome**

Acta Anaesthesiol Scand. 2015 Jan 19. doi: 10.1111/aas.12465. [Epub ahead of print]

Inflammation in cold complex regional pain syndrome.

Dirckx M¹, Stronks DL, VAN Bodegraven-Hof EA, Wesseldijk F, Groeneweg JG, Huygen FJ.

Author information

Abstract

BACKGROUND:

In patients with complex regional pain syndrome (CRPS), the temperature of the affected side often differs from that of the contralateral side. In the acute phase, the affected side is usually warmer than the contralateral side, the so-called 'warm' CRPS. This thermal asymmetry can develop into a colder affected side, the so-called 'cold' CRPS. In contrast to cold CRPS, in warm CRPS, inflammation is generally assumed to be present. However, there are reports of cold CRPS patients, successfully treated with vasodilatation therapy, who subsequently displayed warm CRPS. It seems that inflammation could be 'hidden' behind vasomotor disturbance. This study was designed to test this hypothesis.

METHODS:

A retrospective analysis was made of patients in our CRPS database. We defined three types of CRPS: cold CRPS, neither cold nor warm (intermediate) CRPS, and warm CRPS. Of these patients, the difference between the level of the pro-inflammatory cytokines interleukin (IL)-6 (Δ IL-6) and tumor necrosis factor (TNF)- α (Δ TNF- α) in the affected extremity and that in the contralateral extremity was determined.

RESULTS:

The bilateral difference of the level of these cytokines did not differ among patients with cold CRPS, intermediate CRPS, or those with warm CRPS.

CONCLUSION:

Inflammation may be involved in cold CRPS.

PMID: 25598133

FIBROMYALGIA**Low Frequency sound****The effect of low-frequency sound stimulation on patients with fibromyalgia: a clinical study**

Pain Research and Management, 02/03/2015Naghdi L, et al.

The present study premises that thalamocortical dysrhythmia is implicated in fibromyalgia and that low-frequency sound stimulation (LFSS) can play a regulatory function by driving neural rhythmic oscillatory activity. In the present study, the low-frequency sound stimulation (LFSS) treatment showed no adverse effects and patients receiving the LFSS treatment showed statistically and clinically relevant improvement. Further phase 2 and 3 trials are warranted.

Methods:

The present open-label study with no control group used a repeated-measures design with no noncompleters.

Nineteen female volunteers (median age 51 years; median duration of FM 5.76 years) were administered 10 treatments (twice per week for five weeks).

Treatments involved 23 min of LFSS at 40 Hz, delivered using transducers in a supine position. Measures (repeated before and after treatment) included the Fibromyalgia Impact Questionnaire, Jenkins Sleep Scale, Pain Disability Index, sitting and standing without pain (in minutes), cervical muscle range of motion and muscle tone.

Mean percentages were calculated on end of treatment self-reports of improvement on pain, mood, insomnia and activities of daily living.

Results:

Significant improvements were observed with median scores: Fibromyalgia Impact Questionnaire, 81% (P<0.0001); Jenkins Sleep Scale, 90% (P<0.0001); and Pain Disability Index, 49.1% (P<0.0001).

Medication dose was reduced in 73.68% of patients and completely discontinued in 26.32%.

Time sitting and standing without pain increased significantly (P<0.0001).

Cervical muscle range of motion increased from 25% to 75% (P=0.001), while muscle tone changed from hypertonic to normal (P=0.0002).

Hippocampal shrinking

Reduced hippocampal volume in fibromyalgia

Journal of Pain Research, 02/02/2015McCrae CS, et al.

Objective: Fibromyalgia patients frequently report cognitive abnormalities. As the hippocampus plays an important role in learning and memory, we determined whether individuals with fibromyalgia had smaller hippocampal volume compared with healthy control participants.

Methods: T₁-weighted structural magnetic resonance imaging (MRI) scans were acquired from 40 female participants with fibromyalgia and 22 female healthy controls. The volume of the hippocampus was estimated using the software FreeSurfer. An analysis of covariance model controlling for potentially confounding factors of age, whole brain size, MRI signal quality, and Beck Depression Inventory scores were used to determine significant group differences.

Results: Fibromyalgia participants had significantly smaller hippocampi in both left ($F[1,56]=4.55, P=0.037, \eta^2_p=0.08$) and right hemispheres ($F[1,56]=5.89, P=0.019, \eta^2_p=0.10$). No significant effect of depression was observed in either left or right hemisphere hippocampal volume ($P=0.813$ and $P=0.811$, respectively).

Discussion: Potential mechanisms for reduced hippocampal volume in fibromyalgia include abnormal glutamate excitatory neurotransmission and glucocorticoid dysfunction; these factors can lead to neuronal atrophy, through excitotoxicity, and disrupt neurogenesis in the hippocampus. Hippocampal atrophy may play a role in memory and cognitive complaints among fibromyalgia patients.

Keywords: hippocampus, MRI, brain atrophy, pain

NUTRITION/VITAMINS

Vit D and OP

Osteoporos Int. 2015 Jan 16.

Efficacy of combined treatment with alendronate (ALN) and eldecalcitol, a new active vitamin D analog, compared to that of concomitant ALN, vitamin D plus calcium treatment in Japanese patients with primary osteoporosis.

Sakai A¹, Ito M, Tomomitsu T, Tsurukami H, Ikeda S, Fukuda F, Mizunuma H, Inoue T, Saito H, Nakamura T; e-ADVANCED Study Group.

Author information

Abstract

Combined treatment with alendronate and eldecalcitol was found to be more effective in reducing the bone turnover markers and increasing bone mineral density than alendronate treatment with vitamin D3 and calcium supplementation in the osteoporotic patients.

INTRODUCTION:

We compared the clinical efficacy and safety of combined treatment with alendronate plus eldecalcitol (ALN + ELD) with those of treatment with ALN plus vitamin D and calcium (ALN + VitD).

METHODS:

Osteoporotic 219 patients were randomly assigned to the ALN + ELD, or the ALN + VitD group. Primary endpoint was the inter-group differences in lumbar spine BMD (L-BMD) at patient's last visit. Secondary endpoints included the differences in BMD at other sites and the bone turnover marker (BTM) levels.

RESULTS:

L-BMD, total hip BMD and femoral neck (FN-BMD) increased from baseline by 7.30, 2.41, and 2.70 % in the ALN + ELD group, and by 6.52, 2.27, and 1.18 % in the ALN + VitD group, respectively. Inter-group differences of the L-BMD and total hip BMD values were not significant. The increase of the FN-BMD was larger in the ALN + ELD group than the ALN + VitD group. Reductions of the BTMs were greater in the ALN + ELD group than the ALN + VitD group. Interaction of the percent increase of the L-BMD with the baseline values of the BTMs was observed in the ALN + VitD group only. The increases of the FN-BMD in patients with lower baseline values of type-I-collagen C-telopeptide (sCTX) and serum 25(OH) D levels <20 ng/mL were significantly larger in the ALN + ELD group than the other group.

CONCLUSION:

Combination treatment of ALN plus ELD was more effective in reducing the BTMs and increasing the FN-BMD than ALN treatment with vitamin D3 and calcium.

PMID: 25592133

Vit D and pre mature births

Obstet Gynecol. 2015 Feb;125(2):439-47. doi: 10.1097/AOG.0000000000000621.

Early-pregnancy vitamin d deficiency and risk of preterm birth subtypes.

Bodnar LM¹, Platt RW, Simhan HN.

Author information

Abstract

OBJECTIVE:

To estimate the association between maternal 25-hydroxyvitamin D concentrations and risk of preterm birth subtypes.

METHODS:

We performed a case-cohort study using data and banked samples from patients at a teaching hospital in Pittsburgh, Pennsylvania. Eligible participants were women with a prenatal aneuploidy screening serum sample at or before 20 weeks of gestation who subsequently delivered a singleton, liveborn neonate. Of the 12,861 eligible women, we selected 2,327 at random as well as all remaining preterm birth cases for a total of 1,126 cases. Serum 25-hydroxyvitamin D was measured using liquid chromatography-tandem mass spectrometry. Multivariable log-binomial regression models were used to estimate associations between maternal vitamin D status and preterm birth at 37 weeks of gestation (separately by spontaneous or indicated) and preterm birth at less than 34 weeks of gestation.

RESULTS:

The incidence of preterm birth at less than 37 weeks of gestation was 8.6% overall and 11.3%, 8.6%, and 7.3% among mothers with serum 25-hydroxyvitamin D less than 50, 50-74.9, and 75 nmol/L or greater, respectively (P<.01). After adjustment for maternal race and ethnicity, prepregnancy body mass index, season, smoking, and other confounders, the risk of preterm birth at less than 37 weeks of gestation significantly decreased as 25-hydroxyvitamin D increased to approximately 90 nmol/L and then plateaued (test of nonlinearity P<.01). Results were similar when limiting to cases that were medically indicated or occurred spontaneously and cases occurring at less than 34 weeks of gestation.

CONCLUSION:

Our data support a protective association maternal vitamin D sufficiency and preterm birth that combined with extant epidemiologic data may provide justification for a randomized clinical trial of maternal vitamin D replacement or supplementation to prevent preterm birth.

LEVEL OF EVIDENCE: II

PMID: 25569002

Vit. D and bones

Bone Joint J. 2015 Jan;97-B(1):89-93. doi: 10.1302/0301-620X.97B1.34558.

The prevalence of vitamin D deficiency in patients with vertebral fragility fractures.

Maier GS¹, Seeger JB¹, Horas K², Roth KE³, Kurth AA⁴, Maus U⁵.

Author information**Abstract**

Hypovitaminosis D has been identified as a common risk factor for fragility fractures and poor fracture healing. Epidemiological data on vitamin D deficiency have been gathered in various populations, but the association between vertebral fragility fractures and hypovitaminosis D, especially in males, remains unclear. The purpose of this study was to evaluate serum levels of 25-hydroxyvitamin D (25-OH D) in patients presenting with vertebral fragility fractures and to determine whether patients with a vertebral fracture were at greater risk of hypovitaminosis D than a control population. Furthermore, we studied the seasonal variations in the serum vitamin D levels of tested patients in order to clarify the relationship between other known risk factors for osteoporosis and vitamin D levels.

We measured the serum 25-OH D levels of 246 patients admitted with vertebral fractures (105 men, 141 female, mean age 69 years, sd 8.5), and in 392 orthopaedic patients with back pain and no fractures (219 men, 173 female, mean age 63 years, sd 11) to evaluate the prevalence of vitamin D insufficiency. Statistical analysis found a significant difference in vitamin D levels between patients with vertebral fragility fracture and the control group ($p = 0.036$). In addition, there was a significant main effect of the tested variables: obesity ($p < 0.001$), nicotine abuse ($p = 0.002$) and diabetes mellitus ($p < 0.001$).

No statistical difference was found between vitamin D levels and gender ($p = 0.34$). Vitamin D insufficiency was shown to be a risk factor for vertebral fragility fractures in both men and women. Cite this article: Bone Joint J 2015;97-B:89-93.

KEYWORDS: Fragility fracture; Hypovitaminosis D; Vertebral fracture

PMID: 25568419

Vegetarian diets

BJOG. 2015 Jan 20. doi: 10.1111/1471-0528.13280.

Vegan-vegetarian diets in pregnancy: danger or panacea? A systematic narrative review.

Piccoli G¹, Clari R, Vigotti F, Leone F, Attini R, Cabiddu G, Mauro G, Castelluccia N, Colombi N, Capizzi I, Pani A, Todros T, Avagnina P.

Author information

Abstract

BACKGROUND:

Although vegan-vegetarian diets are increasingly popular, no recent systematic reviews on vegan-vegetarian diets in pregnancy exist.

OBJECTIVES:

To review the literature on vegan-vegetarian diets and pregnancy outcomes.

SEARCH STRATEGY:

PubMed, Embase, and the Cochrane library were searched from inception to September 2013 for pregnancy and vegan or vegetarian Medical Subject Headings (MeSH) and free-text terms.

SELECTION CRITERIA:

Vegan or vegetarian diets in healthy pregnant women. We excluded case reports and papers analysing vegan-vegetarian diets in poverty and malnutrition. Searching, paper selection, and data extraction were performed in duplicate.

DATA COLLECTION AND ANALYSIS:

The high heterogeneity of the studies led to a narrative review.

MAIN RESULTS:

We obtained 262 full texts from 2329 references; 22 selected papers reporting maternal-fetal outcomes (13) and dietary deficiencies (nine) met the inclusion criteria. None of the studies reported an increase in severe adverse outcomes or in major malformations, except one report of increased hypospadias in infants of vegetarian mothers. Five studies reported vegetarian mothers had lower birthweight babies, yet two studies reported higher birthweights. The duration of pregnancy was available in six studies and was similar between vegan-vegetarians and omnivores. The nine heterogeneous studies on microelements and vitamins suggest vegan-vegetarian women may be at risk of vitamin B12 and iron deficiencies.

AUTHOR'S CONCLUSIONS:

The evidence on vegan-vegetarian diets in pregnancy is heterogeneous and scant. The lack of randomised studies prevents us from distinguishing the effects of diet from confounding factors. Within these limits, vegan-vegetarian diets may be considered safe in pregnancy, provided that attention is paid to vitamin and trace element requirements.

KEYWORDS: Birthweight; maternal-fetal outcomes; pregnancy; vegan diet; vegetarian diet

PMID: 25600902

Glucosamine and Chondroitin and arthritis

Ann Rheum Dis. 2013 Dec 13. doi: 10.1136/annrheumdis-2013-203906.

First-line analysis of the effects of treatment on progression of structural changes in knee osteoarthritis over 24 months: data from the osteoarthritis initiative progression cohort.

Martel-Pelletier J¹, Roubille C, Abram F, Hochberg MC, Dorais M, Delorme P, Raynauld JP, Pelletier JP.

Author information

Abstract

OBJECTIVE:

To determine, using data from participants enrolled in the progression cohort of the OAI, the effects of conventional osteoarthritis (OA) pharmacological treatment and those of the combination of glucosamine and chondroitin sulfate (Glu/CS) on knee structural changes.

METHODS:

Six hundred patients with knee OA were stratified based on whether or not they received for 24 consecutive months the OA conventional pharmacological treatment and/or Glu/CS. The main outcomes were knee structural changes, including the loss of joint space width (JSW) and of cartilage volume measured by quantitative MRI.

RESULTS:

Participants reported taking (+) (n=300) or not taking (-) (n=300) OA treatment (analgesic/NSAIDs). The +analgesic/NSAIDs participants had higher Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores (p<0.001) and smaller JSW (p=0.01), reflecting more severe disease at baseline. In the -analgesic/NSAIDs group, participants taking Glu/CS had significantly reduced loss of cartilage volume at 24 months in the medial central plateau (p=0.007). Further subdivision revealed that this effect of Glu/CS occurred in participants with a higher severity of the disease (JSW≤median). In the +analgesic/NSAIDs group, those taking Glu/CS had significantly reduced loss of cartilage volume in the global plateau at 12 months (p=0.05), and in the central plateau at 24 months (p=0.05). These effects occurred in participants with less disease severity (JSW>median). By contrast, no significant reduction in JSW was found between all groups.

CONCLUSIONS:

In +analgesic/NSAIDs groups and -analgesic/NSAIDs groups, participants who took Glu/CS had reduced loss of cartilage volume over 24 months in subregions when assessed with qMRI, arguing for a disease-modifying effect of Glu/CS which could not be identified by X-rays.

KEYWORDS:

Knee Osteoarthritis; Magnetic Resonance Imaging; Treatment

PMID:24336337

Hip fracture and nicotine

Osteoporos Int. 2015 Jan 24.

Plasma dimethylglycine, nicotine exposure and risk of low bone mineral density and hip fracture: the Hordaland Health Study.

Øyen J¹, Svingen GF, Gjesdal CG, Tell GS, Ueland PM, Lysne V, Apalset EM, Meyer K, Vollset SE, Nygård OK.

Author information

Abstract

In the large community-based Hordaland Health Study, low plasma dimethylglycine was associated with low bone mineral density in both middle-aged and elderly subjects and to an increased risk of subsequent hip fracture among the elderly. These associations seemed to be particularly strong among subjects exposed to nicotine.

INTRODUCTION:

Dimethylglycine (DMG) is a product of the choline oxidation pathway and formed from betaine during the folate-independent remethylation of homocysteine (Hcy) to methionine. Elevated plasma DMG levels are associated with atherosclerotic cardiovascular disease and inflammation, which in turn are related to osteoporosis. High plasma total Hcy and low plasma choline are associated with low bone mineral density (BMD) and hip fractures, but the role of plasma DMG in bone health is unknown.

METHODS:

We studied the associations of plasma DMG with BMD among 5315 participants (46-49 and 71-74 years old) and with hip fracture among 3310 participants (71-74 years old) enrolled in the Hordaland Health Study.

RESULTS:

In age and sex-adjusted logistic regression models, subjects in the lowest versus highest DMG tertile were more likely to have low BMD (odds ratio [OR] 1.68, 95 % confidence interval [CI] 1.43-1.99). The association was stronger in participants exposed compared to those unexposed to nicotine (OR 2.31, 95 % CI 1.73-3.07 and OR 1.43, 95 % CI 1.16-1.75, respectively, p interaction = 0.008). In the older cohort, Cox regression analyses adjusted for sex showed that low plasma DMG was associated with an increased risk of hip fracture (hazard ratio [HR] 1.70, 95 % CI 1.28-2.26). A trend toward an even higher risk was found among women exposed to nicotine (HR 3.41, 95 % CI 1.40-8.28).

CONCLUSION:

Low plasma DMG was associated with low BMD and increased risk of hip fractures. A potential effect modification by nicotine exposure merits particular attention.

PMID: 25616506

beer and wine and OA

Arthritis Res Ther. 2015 Feb 5;17(1):23.

Beer and wine consumption and risk of knee or hip osteoarthritis: a case control study.

Muthuri SG, Zhang W, Maciewicz RA, Muir K, Doherty M.

Abstract

Introduction: The aim of this study was to investigate the association between alcoholic and non-alcoholic beverages and knee or hip osteoarthritis (OA). **Methods** We conducted a case-control study of Caucasian men and women aged 45 to 86 years of age from Nottingham, UK. Cases had clinically severe symptoms and radiographic knee or hip OA; controls had no symptoms and no radiographic knee or hip OA. Exposure information was sought using interview-based questionnaires and a semi-quantitative food frequency questionnaire to assess beverage consumption at ages 21 to 50 years. Odds ratios (ORs), adjusted ORs (aORs), 95% confidence intervals (CI) and P values were estimated using logistic regression models.

Results A total of 1,001 knee OA, 993 hip OA and 933 control participants were included in the study. Increasing beer consumption was associated with an increasing risk of OA (P for trend ≤ 0.001). Compared to those who did not consume beer, aORs for people who consumed 20 or more servings of beer were 1.93 (95% CI 1.26 to 2.94) and 2.15 (95% CI 1.45 to 3.19) for knee OA and hip OA, respectively. In contrast, increasing levels of wine consumption were associated with decreased likelihood of knee OA (P for trend < 0.001). Compared to those who did not consume wine, aOR for knee OA among those who consumed 4 to 6 glasses of wine per week and ≥ 7 glasses of wine per week was 0.55 (95% CI 0.34 to 0.87) and 0.48 (95% CI 0.29 to 0.80), respectively. No association was identified between non-alcoholic beverages and knee or hip OA.

Conclusion Beer consumption appears to be a risk factor for knee and hip OA whereas consumption of wine has a negative association with knee OA. The mechanism behind these findings is speculative but warrants further study.

PMID: 25652201

Avocado and cholesterol

An avocado a day may help keep bad cholesterol at bay

American Heart Association News, 01/08/2015

Individuals on a moderate-fat diet who ate an avocado every day had lower bad cholesterol than those on a similar diet without an avocado a day or on a lower-fat diet. New research was published in the Journal of the American Heart Association. Researchers found:

- Compared to the baseline average American diet, low-density lipoprotein (LDL) – the so called ‘bad cholesterol’ – was 13.5 mg/dL lower after consuming the moderate fat diet that included an avocado. LDL was also lower on the moderate fat diet without the avocado (8.3 mg/dL lower) and the lower fat diet (7.4 mg/dL lower), though the results were not as striking as the avocado diet.
- Several additional blood measurements were also more favorable after the avocado diet versus the other two cholesterol-lowering diets as well: total cholesterol, triglycerides, small dense LDL, non-HDL cholesterol, and others.

PHARMACOLOGY

Stroke and anti-inflammatory medications

J Thromb Haemost. 2015 Jan 22. doi: 10.1111/jth.12855.

Risk of ischaemic stroke associated with non-steroidal anti-inflammatory drugs and paracetamol: a population-based case-control study.

García-Poza P¹, de Abajo FJ, Gil MJ, Chacón A, Bryant V, García-Rodríguez LA.

Author information

Abstract

OBJECTIVE:

To assess the risk of nonfatal ischaemic stroke associated with NSAIDs and paracetamol. The effects of dose, duration of treatment, background cardiovascular (CV) risk and use of concomitant aspirin were studied.

METHODS:

We performed a population-based case-control study. Patients were considered exposed if they were on treatment within a 30-day window before the index date. We estimated adjusted odds ratios (ORs) and their 95% CI using logistic regression.

RESULTS:

2888 cases and 20000 controls were included. No increased risk was observed with traditional NSAIDs as a group (OR= 1.03; 0.90-1.19), but results varied across individual agents and conditions of use. An increased risk was found with diclofenac (OR=1.53; 95%CI: 1.19-1.97), in particular when used at high doses (OR=1.62; 1.06-2.46), over long-term periods (>365 days; OR=2.39; 1.52-3.76) and in patients at high background CV risk (OR=1.78; 1.23-2.58), as well as with aceclofenac when used at high doses (OR=1.67; 1.05-2.67), long-term treatments (OR=2.00; 1.14-3.53) and in patients with CV risk factors (OR=2.33; 1.40-3.87). No association was found with ibuprofen (OR=0.94; 0.76-1.17) or naproxen (OR=0.68; 0.36-1.29). The concomitant use of aspirin did not show a significant effect modification. Paracetamol did not increase the risk overall (OR= 0.97; 0.85-1.10), or in patients at high CV risk (OR=0.94; 0.78-1.14).

CONCLUSIONS:

Diclofenac and aceclofenac increase the risk of ischaemic stroke while ibuprofen and naproxen do not. Dose, duration and baseline CV risk, but not aspirin use, appear to modulate the risk. Paracetamol does not increase the risk, even in patients at high background CV risk. This article is protected by copyright. All rights reserved.

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KEYWORDS:

Cerebrovascular accident; NSAIDs; Stroke; adverse drug reaction; paracetamol

PMID: 25611553

Statin

Cephalalgia. 2014 Nov 25. pii: 0333102414559733

Association of statin use and risk for severe headache or migraine by serum vitamin D status: A cross-sectional population-based study.

Buettner C¹, Burstein R².

Author information

Abstract

OBJECTIVE:

The objective of this article is to evaluate whether statin use and vitamin D status is associated with severe headache or migraine in a nationally representative sample.

METHODS:

We conducted a cross-sectional study of US individuals aged ≥ 40 years for whom information on statin use, serum 25-hydroxy vitamin D (25(OH)D), and self-reported severe headache or migraine had been collected. We calculated prevalence estimates of headache according to statin and 25(OH)D, and conducted adjusted logistic regression analyses stratified by the median 25(OH)D (≤ 57 and >57 nmol/l).

RESULTS:

Among 5938 participants, multivariable-adjusted logistic regression showed that statin use was significantly associated with a lower prevalence of severe headache or migraine (OR 0.67; 95% CI 0.46, 0.98, $p = 0.04$). We found a significant interaction between statin use and 25(OH)D with the prevalence of severe headache or migraine (p for interaction = 0.005). Among participants who had serum 25(OH)D > 57 nmol/l, statin use was associated with a multivariable-adjusted odds ratio of 0.48 (95% CI 0.32, 0.71, $p = 0.001$) for having severe headache or migraine. Among those with 25(OH)D ≤ 57 nmol/l, no significant association was observed between statin use and severe headache or migraine.

CONCLUSION:

Statin use in those with higher serum vitamin D levels is significantly associated with lower odds of having severe headache or migraine.

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KEYWORDS: 25-hydroxy vitamin D; Headache; epidemiology; migraine; statin

PMID: 25424706

**ELECTROTHERAPY
NEUROLOGICAL CONDITIONS**