

ABSTRACTS

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2. LBP

MRI / interventions

Eur Spine J. 2015 Sep 2.

Do MRI findings identify patients with low back pain or sciatica who respond better to particular interventions? A systematic review.

Steffens D¹, Hancock MJ, Pereira LS, Kent PM, Latimer J, Maher CG.
Author information

Abstract

PURPOSE:

Magnetic resonance imaging (MRI) can reveal a range of degenerative findings and anatomical abnormalities; however, the clinical importance of these remains uncertain and controversial. We aimed to investigate if the presence of MRI findings identifies patients with low back pain (LBP) or sciatica who respond better to particular interventions.

METHODS:

MEDLINE, EMBASE and CENTRAL databases were searched. We included RCTs investigating MRI findings as treatment effect modifiers for patients with LBP or sciatica. We excluded studies with specific diseases as the cause of LBP. Risk of bias was assessed using the criteria of the Cochrane Back Review Group. Each MRI finding was examined for its individual capacity for effect modification.

RESULTS:

Eight published trials met the inclusion criteria. The methodological quality of trials was inconsistent. Substantial variability in MRI findings, treatments and outcomes across the eight trials prevented pooling of data. Patients with Modic type 1 when compared with patients with Modic type 2 had greater improvements in function when treated by Diprosan (steroid) injection, compared with saline. Patients with central disc herniation when compared with patients without central disc herniation had greater improvements in pain when treated by surgery, compared with rehabilitation.

CONCLUSIONS:

Although individual trials suggested that some MRI findings might be effect modifiers for specific interventions, none of these interactions were investigated in more than a single trial. High quality, adequately powered trials investigating MRI findings as effect modifiers are essential to determine the clinical importance of MRI findings in LBP and sciatica (PROSPERO: CRD42013006571).

PMID:26329648

LBP in athletes

Eur Spine J. 2015 Sep 3.

Severe back pain in elite athletes: a cross-sectional study on 929 top athletes of Germany.

Schulz SS¹, Lenz K, Büttner-Janzen K.
Author information

Abstract

PURPOSE:

The cross-sectional study evaluates the incidence, localization, treatment, and influencing factors of back pain (BP) in Germany's elite athletes.

METHODS:

An online questionnaire was sent out to 3564 top athletes. We used the VAS to identify the intensity of BP and SPSS for statistical analyses.

RESULTS:

929 athletes responded. 514 (55.3 %) had BP within the last 12 months, mainly located in the lumbar spine (n = 293, 56.1 %). The average pain intensity was 5.75/10. Back-affecting exercise and additional burdens (e.g. at their place of work) did not increase the intensity of BP. When dividing the athletes into two groups according to the BP intensity, BP did not correlate with gender, age or BMI.

CONCLUSION:

At least every tenth athlete suffers temporarily from low BP at a level at which spine surgery could be the only option to relieve the pain. BP occurs independently of back-affecting training and additional stress. Further evaluation is needed to identify factors for avoiding severe BP in top athletes.

PMID:26337926

History taking and illness perceptions

Disabil Rehabil. 2015 Aug 26:1-12.

History taking by physiotherapists with low back pain patients: are illness perceptions addressed properly?

Roussel NA¹, Neels H, Kuppens K, Laysen M, Kerckhofs E, Nijs J, Beetsma AJ, Van Wilgen CP.
Author information

Abstract

PURPOSE:

Despite the increasing evidence that illness perceptions should be addressed in patients, there is a lack of studies evaluating whether physiotherapists question illness perceptions. This study, using a mixed-methods design, investigates the integration of illness perceptions during the first consultation of physiotherapists treating patients with low back pain (LBP).

METHODS:

Thirty-four physiotherapists performed usual history taking in a patient with non-specific LBP. The interview was audiotaped and illness perceptions were indexed using an observational instrument, based on the domains of Leventhal's Common Sense Model. Patients were also asked to fill in the Illness Perception Questionnaire-Revised for LBP.

RESULTS:

Physiotherapists assessed the illness identity, also perceptions regarding the (physical) cause and controllability of LBP were evaluated. Illness perceptions, such as timeline, consequences, coherence and emotional representation, were poorly assessed. Results of the questionnaire reveal that LBP-patients report overuse, workload and bad posture as primary cause. Patients held positive beliefs about the controllability and have high illness coherence.

CONCLUSION:

Belgian physiotherapists mainly question bio-medically oriented illness perceptions, e.g. physical symptoms and causes, but do not sufficiently address psychosocially oriented illness perceptions as recommended in LBP guidelines. Implications for Rehabilitation Belgian physiotherapists mainly question biomedical oriented illness perceptions (illness identity, provoking factors and treatment control) in patients with low back pain (LBP) during the history taking (i.e. the first consultation). From a bio-psycho-social view psychosocially oriented illness perceptions should be incorporated in the daily routine of physiotherapist's to comply with the bio-psycho-social treatment guidelines for LBP. Continuing education is mandatory in order to improve physiotherapists' knowledge regarding the use of all dimensions of illness perceptions in the assessment of patients with LBP.

KEYWORDS: Communication; illness beliefs; lower back pain; medical history taking and diagnostic techniques

PMID: 26308888

Kinesiophobia and sciatica

Phys Ther. 2015 Sep;95(9):1217-23. doi: 10.2522/ptj.20140458. Epub 2015 Apr 30.

Does Kinesiophobia Modify the Effects of Physical Therapy on Outcomes in Patients With Sciatica in Primary Care? Subgroup Analysis From a Randomized Controlled Trial.

Verwoerd AJ¹, Luijsterburg PA², Koes BW³, El Barzouhi A⁴, Verhagen AP⁵.
Author information

Abstract**BACKGROUND:**

A higher level of kinesiophobia appears to be associated with poor recovery in patients with sciatica.

OBJECTIVE:

The aim of this study was to investigate whether kinesiophobia modifies the effect of physical therapy on outcomes in patients with sciatica.

DESIGN:

This was a subgroup analysis from a randomized controlled trial.

SETTING:

The study was conducted in a primary care setting.

PATIENTS:

A total of 135 patients with acute sciatica participated.

INTERVENTION:

Patients were randomly assigned to groups that received (1) physical therapy plus general practitioners' care (intervention group) or (2) general practitioners' care alone (control group).

MEASUREMENTS:

Kinesiophobia at baseline was measured with the Tampa Scale for Kinesiophobia (TSK) and a single substitute question for kinesiophobia (SQK). Pain and recovery were assessed at 3- and 12-month follow-ups. Regression analysis was used to test for interaction between the level of kinesiophobia at baseline and treatment allocation. Subgroup results were calculated for patients classified with high fear of movement and for those classified with low fear of movement.

RESULTS:

Kinesiophobia at baseline interacted with physical therapy in the analysis with leg pain intensity at 12-month follow-up. Kinesiophobia at baseline did not interact with physical therapy regarding any outcome at 3-month follow-up or recovery at 12-month follow-up. When comparing both treatment groups in the subgroup of patients with high fear of movement (n=73), the only significant result was found for leg pain intensity difference from baseline at 12-month follow-up (intervention group: \bar{X} =-5.0, SD=2.6; control group: \bar{X} =-3.6, SD=2.7).

LIMITATIONS:

The post hoc study design and relatively small sample size were limitations of the study.

CONCLUSIONS:

In 135 patients with sciatica, evidence shows that patients with a higher level of kinesiophobia at baseline may particularly benefit from physical therapy with regard to decreasing leg pain intensity at 12-month follow-up.

PMID:25929529

Compartment syndrome

Excruciating Low Back Pain After Strenuous Exertion: Beware of Lumbar Paraspinal Compartment Syndrome

Peter Vanbrabant, MD Lieven Moke, MD Wouter Meersseman, PhD Geert Vanderschueren, PhD Daniel Knockaert, PhD

Background

Low back pain is extremely common and usually a minor self-limiting condition. Rarely, however, it is a harbinger of serious medical illness. Paraspinal compartment syndrome is a rare condition, but its timely recognition is important to allow adequate treatment.

Case Report

A 16-year-old boy presented to the Emergency Department (ED) with severe low back pain, necessitating intravenous opioids. Laboratory results showed severe rhabdomyolysis. Magnetic resonance imaging of the lumbar spine showed diffuse edema and swelling in the paraspinal muscles. Aggressive fluid therapy was started but despite narcotic analgesia the pain persisted and creatine kinase (CK) levels increased. Compartment pressures of the erector spinae were found to be increased. The decision was made to proceed with bilateral paraspinal fasciotomies. Postoperatively, the patient noted immediate pain relief with rapid decrease of CK level. The patient is pain free and resumed running and swimming 3 months after admission in the ED.

Why Should an Emergency Physician Be Aware of This?

Although paraspinal compartment syndrome is a rare condition, its recognition is of paramount importance to allow adequate surgical treatment, preventing muscle necrosis. Although back pain most often has a benign course, a careful history and physical examination in patients presenting with low back pain allows determination of “red flags.” Mandatory further diagnostic tests can identify underlying serious illness.

Keywords: paraspinal compartment syndrome, rhabdomyolysis, low back pain

3. DISC

Indian genetics assoc. with DJD

Eur Spine J. 2015 Sep;24(9):1969-75. doi: 10.1007/s00586-014-3687-y. Epub 2014 Nov 22.

Genetic susceptibility of lumbar degenerative disc disease in young Indian adults.

Rajasekaran S¹, Kanna RM, Senthil N, Raveendran M, Ranjani V, Cheung KM, Chan D, Kao PY, Yee A, Shetty AP.

Author information

Abstract

PURPOSE:

Although the exact mechanisms that lead to degenerative disc disease (DDD) are not well understood, a significant genetic influence has been found. Focusing on DDD that occurs in young adults can be valuable in determining the exact role of genetic predisposition to DDD.

METHODS:

Patients (<40 years) with lumbar disc degeneration were evaluated with MRI imaging (1.5 Tesla) and genetic association analysis for 58 single nucleotide polymorphism (SNP) of 35 candidate genes was performed. Disc degeneration of individual discs of lumbar spine from L1 to S1 was graded by Pfirrmann's grading. The subjects were stratified into two groups based on Total Disc Degenerative Score (TDDS). Based on TDDS, the severity of DDD was classified as mild (Group A: TDDS <10) and severe (Group B: TDDS >10).

RESULTS:

695 Indian subjects including 308 with mild TDDS and 387 with severe TDDS were studied. The mean age of the patients was 29.6 ± 6.9 years in group A and 31.7 ± 6.1 in group B ($p < 0.05$). Five of the 35 candidate genes viz., rs1337185 of COL11A ($p = 0.02$), rs5275 ($p = 0.03$) and rs5277 ($p = 0.05$) of COX2, rs7575934 of IL1F5 ($p = 0.04$), rs3213718 of CALM1 ($p = 0.04$) and rs162509 of ADAMTS5 ($p = 0.04$) were found to be significantly associated with severe TDDS.

CONCLUSION:

The study identifies specific SNP associations of five genes in young adults with severe lumbar disc degeneration. These five genes (COL11A1, ADAMTS5, CALM1, IL1F5 and COX2) have different functions in the matrix metabolism, intracellular signalling and inflammatory cascade. This shows that disc degeneration is a complex disease with an intricate interplay of multiple genetic polymorphisms.

PMID:25416170

Degeneration and motion

Eur Spine J. 2015 Sep;24(9):1893-900. doi: 10.1007/s00586-014-3277-z. Epub 2014 Mar 28.

The change of whole lumbar segmental motion according to the mobility of degenerated disc in the lower lumbar spine: a kinetic MRI study.

Lee SH¹, Daffner SD, Wang JC, Davis BC, Alanay A, Kim JS.

Author information

Abstract

PURPOSE:

To analyze the effects of mobility of degenerated disc in the lower lumbar discs (L4-5 and L5-S1) on both whole lumbar motion and adjacent segment ROM.

METHODS:

The kMRIs with disc degeneration at L4-5 or L5-S1 were classified into three groups: the normal group, the motion-preserved (MP) group and the motion-lost (ML) group based on range of motion (ROM) of 5° in the degenerated segment. Each segmental ROM, whole lumbar motion, and the contribution % of the upper lumbar spine (ULS: L1-2-3) and the lower lumbar spine (LLS: L4-5-S1) motion to whole lumbar motion were measured and compared with each of the other groups.

RESULTS:

There were 94, 99 and 66 patients in the normal group, MP group and ML group, respectively. The normal group showed no significant difference compared to the MP group in all ROM parameters. The ML group showed significantly less whole lumbar motion, more contribution % in the ULS and less in the LLS than the normal and the MP groups. The ROM in the superior adjacent segment in the ML group was not significantly different between that in the normal and MP group.

CONCLUSIONS:

Degenerated lumbar discs did not show hypermobility within functional ROM. Loss of segmental ROM from advanced disc degeneration did not cause an increase in the ROM of the superior adjacent segment in vivo. When the LLS had motion-lost, advanced disc degeneration, whole lumbar motion was significantly decreased and compensatory increase in ROM was accomplished by the ULS.

PMID:24676853

7. PELVIC ORGANS/WOMAN'S HEALTH

Myofascial release for the pelvic floor

Female Pelvic Med Reconstr Surg. 2015 Sep-Oct;21(5):252-6. doi: 10.1097/SPV.000000000000195.

Pelvic Floor Physical Therapy as Primary Treatment of Pelvic Floor Disorders With Urinary Urgency and Frequency-Predominant Symptoms.

Adams SR¹, Dessie SG, Dodge LE, Mckinney JL, Hacker MR, Elkadry EA.
Author information

Abstract

OBJECTIVE:

To assess the efficacy of pelvic floor physical therapy (PFPT) as primary treatment of urinary urgency and frequency symptoms

METHODS:

We conducted a prospective cohort study of women with urinary urgency and frequency symptoms. Participants underwent PFPT once or twice per week for 10 weeks. Symptom improvement was assessed by validated questionnaires (Pelvic Floor Distress Inventory-Short Form 20 and Patient Global Impression of Improvement), voiding diaries, and subjective measures.

RESULTS:

Fifty-seven participants enrolled; 21 (36.8%) withdrew or completed less than 5 weeks of PFPT. Thirty-one (54.4%) of the remaining 36 participants completed 10 weeks of PFPT. The mean age of the study group (n = 36) was 48.9 ± 15.0 years. The primary diagnoses were overactive bladder syndrome (n = 24, 66.7%) and painful bladder syndrome (n = 12, 33.3%). Women attended a median of 14.0 (interquartile range [IQR], 8.0-16.0) PFPT visits over a median of 11.9 weeks (IQR, 10.0-18.1). At baseline, the median Pelvic Floor Distress Inventory-Short Form 20 score was 79.2 (IQR, 53.1-122.9), and decreased to 50.0 (IQR, 25.0-88.5; P < 0.001) after PFPT; the urinary and prolapse symptom subscales both decreased significantly. Participants reported a decrease from a median of 10.0 voids per day to 8.0 (P < 0.001). On the Patient Global Impression of Improvement, 62.5% of women reported that they were "much better" or "very much better."

CONCLUSIONS:

The PFPT with myofascial release techniques improves urinary symptoms while avoiding medications and more invasive therapies. The high dropout rates suggest that motivation or logistic factors may play a significant role in the utilization and success of this treatment option.

PMID:26313494

Pelvic floor in runners

Scand J Med Sci Sports. 2015 Sep 15. doi: 10.1111/sms.12546.

Urinary incontinence and other pelvic floor dysfunctions in female athletes in Brazil: A cross-sectional study.

Almeida MB¹, Barra AA¹, Saltiel F², Silva-Filho AL³, Fonseca AM³, Figueiredo EM².
Author information

Abstract

The pelvic floor (PF) provides support to all pelvic organs, as well as appropriately closure/opening mechanism of the urethra, vagina, and anus. Therefore, it is likely that female athletes involved in high-impact and in strong-effort activities are at risk for the occurrence of urinary incontinence (UI). This study aimed to investigate the occurrence of UI and other PF dysfunctions (PFD) [anal incontinence (AI), symptoms of constipation, dyspareunia, vaginal laxity, and pelvic organ prolapse] in 67 amateur athletes (AT) compared with a group 96 of nonathletes (NAT). An ad hoc survey based on questions from reliable and valid instruments was developed to investigate the occurrence of PFD symptoms. The risk of UI was higher in AT group (odds ratio: 2.90; 95% CI: 1.50-5.61), mostly among artistic gymnastics and trampoline, followed by swimming and judo athletes. Whereas, AT group reported less straining to evacuate (OR: 0.46; 95% CI: 0.22-0.96), manual assistance to defecate (OR: 0.24; 95% CI: 0.05-1.12), and a higher stool frequency (OR: 0.29; 95% CI: 0.13-0.64) than NAT group. The occurrence of loss of gas and sexual symptoms was high for both groups when compared with literature, although with no statistical difference between them. Pelvic organ prolapse was only reported by nonathletes. Athletes are at higher risk to develop UI, loss of gas, and sexual dysfunctions, either practicing high-impact or strong-effort activities. Thus, pelvic floor must be considered as an entity and addressed as well. Also, women involved in long-term high-impact and strengthening sports should be advised of the impact of such activities on pelvic floor function and offered preventive PFD strategies as well.

KEYWORDS: Female athletes; anal incontinence; dyspareunia; epidemiology; pelvic floor dysfunction; pelvic organ prolapse; urinary incontinence; vaginal laxity; women's health
PMID: 26369504

8. VISCERA

Epidemic of IBD among infants

J Intern Med. 2015 Sep 10. doi: 10.1111/joim.12413.

The emerging global epidemic of paediatric inflammatory bowel disease - causes and consequences.

Malmborg P¹, Hildebrand H¹.
[Author information](#)

Abstract

Two decades ago, paediatric inflammatory bowel disease (IBD) drew only modest interest from the international paediatric community. Since then, dramatically globally increasing incidence rates have made childhood-onset IBD a priority for most paediatric gastroenterologists. The emerging pandemic of paediatric IBD has fuelled a quest to identify the recent changes in early life exposures that could explain the increasing risk for IBD amongst today's children. Treatment of children with IBD should aim for symptom control but should also target restoration of growth and prevention of pubertal delay. The paediatric IBD phenotype seems to be characterized by more extensive disease location, and some comparative studies have suggested that childhood-onset IBD also represents a more severe phenotype than the adult-onset IBD form. In this review, we analyse recent global incidence trends of paediatric IBD. We present an update on the known and suggested risk factors that could explain the emerging global epidemic of paediatric IBD. We also draw attention to differences in treatment between children and adults with IBD. Finally, we highlight latest follow-up studies that question the proposed dynamic and aggressive nature of childhood-onset IBD.

KEYWORDS: Crohn's disease; epidemiology; growth; inflammatory bowel disease; ulcerative colitis

PMID:26355194

IBS symptoms

J Pediatr Gastroenterol Nutr. 2015 Sep;61(3):323-9. doi: 10.1097/MPG.0000000000000795.

Symptom Profiles in Patients With Irritable Bowel Syndrome or Functional Abdominal Pain Compared With Healthy Controls.

Varni JW¹, Shulman RJ, Self MM, Nurko S, Saps M, Saeed SA, Bendo CB, Patel AS, Dark CV, Zacur GM, Pohl JF; Pediatric Quality of Life Inventory Gastrointestinal Symptoms Module Testing Study Consortium.
Author information

Abstract**OBJECTIVES:**

Patient-reported outcome (PRO) measures of gastrointestinal symptoms are recommended to determine treatment effects for irritable bowel syndrome (IBS) and functional abdominal pain (FAP). Study objectives were to compare the symptom profiles of pediatric patients with IBS or FAP with healthy controls and with each other using the PedsQL Gastrointestinal Symptoms and Gastrointestinal Worry Scales, and to establish clinical interpretability of PRO scale scores through identification of minimal important difference (MID) scores.

METHODS:

Gastrointestinal Symptoms and Worry Scales were completed in a 9-site study by 154 pediatric patients and 161 parents (162 families; IBS n=46, FAP n=119). Gastrointestinal Symptoms Scales measuring stomach pain, stomach discomfort when eating, food and drink limits, trouble swallowing, heartburn and reflux, nausea and vomiting, gas and bloating, constipation, blood in poop, and diarrhea were administered along with Gastrointestinal Worry Scales. A matched sample of 447 families with healthy children completed the scales.

RESULTS:

Gastrointestinal Symptoms and Worry Scales distinguished between patients with IBS or FAP compared with healthy controls ($P < 0.001$), with larger effect sizes (> 1.50) for symptoms indicative of IBS or FAP, demonstrating a broad multidimensional gastrointestinal symptom profile and clinical interpretability with MID scores for individual PRO scales. Patients with IBS manifested more symptoms of constipation, gas and bloating, and diarrhea than patients with FAP.

CONCLUSIONS:

Patients with IBS or FAP manifested a broad gastrointestinal symptom profile compared with healthy controls with large differences, indicating the critical need for more effective interventions to bring patient functioning within the range of healthy functioning.
PMID:26020482

IBS and arthritis

Clin Rheumatol. 2015 Sep 10.

Occult spondyloarthritis in inflammatory bowel disease.

Bandinelli F¹, Manetti M², Ibba-Manneschi L².

[Author information](#)

Abstract

Spondyloarthritis (SpA) is a frequent extra-intestinal manifestation in patients with inflammatory bowel disease (IBD), although its real diffusion is commonly considered underestimated. Abnormalities in the microbioma and genetic predisposition have been implicated in the link between bowel and joint inflammation. Otherwise, up to date, pathogenetic mechanisms are still largely unknown and the exact influence of the bowel activity on rheumatic manifestations is not clearly explained. Due to evidence-based results of clinical studies, the interest on clinically asymptomatic SpA in IBD patients increased in the last few years. Actually, occult enthesitis and sacroiliitis are discovered in high percentages of IBD patients by different imaging techniques, mainly enthesitis ultrasound (US) and sacroiliac joint X-ray examinations. Several diagnostic approaches and biomarkers have been proposed in an attempt to correctly classify and diagnose clinically occult joint manifestations and to define clusters of risk for patient screening, although definitive results are still lacking. The correct recognition of occult SpA in IBD requires an integrated multidisciplinary approach in order to identify common diagnostic and therapeutic strategies. The use of inexpensive and rapid imaging techniques, such as US and X-ray, should be routinely included in daily clinical practice and trials to correctly evaluate occult SpA, thus preventing future disability and worsening of quality of life in IBD patients.

KEYWORDS: Inflammatory bowel disease; Occult enthesitis; Occult sacroiliitis; Spondyloarthritis

PMID: 26354428

Arterial stiffness in celiac disease

Eur J Gastroenterol Hepatol. 2015 Oct;27(10):1193-9. doi: 10.1097/MEG.0000000000000437.

Increased arterial stiffness and its relationship with inflammation, insulin, and insulin resistance in celiac disease.

Korkmaz H¹, Sozen M, Kebapcilar L.
Author information

Abstract

OBJECTIVE:

Celiac disease (CD) is a lifelong, chronic, immune-mediated, inflammatory small bowel disorder, precipitated by exposure to dietary gluten and related proteins in genetically predisposed individuals. Recent studies have shed new light on the importance of inflammation in the pathogenesis of arterial stiffness. The aim of this study was to evaluate arterial stiffness using pulse wave velocity (PWV) in adult CD patients without cardiovascular risk factors in comparison with a control group.

PATIENTS AND METHODS:

A total of 58 patients with CD without cardiovascular risk factors and age-matched and sex-matched healthy controls were enrolled in the study. All patients completed a standard questionnaire form, and various laboratory parameters were assessed. Vascular measurements, including PWV, were carried out using a Mobil-O-Graph 24-h pulse wave analysis monitor, an automatic oscillometric device.

RESULTS:

Although cardiovascular risk factors, such as low-density lipoprotein cholesterol and triglyceride, were significantly lower ($P < 0.05$) in celiac patients than in controls, the erythrocyte sedimentation rate, C-reactive protein, insulin, homeostasis model assessment of insulin resistance, homocysteine, and 24 h, day, and night PWV values were higher in patients with CD than in controls ($P < 0.05$). A multiple linear regression analysis showed that PWV was correlated positively with age and the duration of CD.

CONCLUSION:

This study found increased arterial stiffness, homocysteine, erythrocyte sedimentation rate, C-reactive protein, insulin, and homeostasis model assessment of insulin resistance in patients with CD and provides evidence for the potential contribution of these parameters and inflammation toward arterial stiffening, independent of conventional cardiovascular risk factors.

PMID: 26181110

12 A. WHIPLASH

Psychological approaches

Spine J. 2015 Aug 13. pii: S1529-9430(15)01221-8. doi: 10.1016/j.spinee.2015.08.011.

Are psychological interventions effective for the management of neck pain and whiplash-associated disorders? A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration.

Shearer HM¹, Carroll LJ², Wong JJ³, Côté P⁴, Varatharajan S³, Southerst D³, Sutton D³, Randhawa K³, Yu H³, Mior S⁵, van der Velde G⁶, Nordin M⁷, Stupar M⁸, Taylor-Vaisey A³.
Author information

Abstract

BACKGROUND CONTEXT: In 2008, the lack of published evidence prevented the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders (NPTF) from commenting on the effectiveness of psychological interventions for the management of neck pain.

PURPOSE: To update findings of the NPTF and evaluate the effectiveness of psychological interventions for the management of neck pain and associated disorders (NAD) or whiplash-associated disorders (WAD).

STUDY DESIGN/SETTING: Systematic review and best-evidence synthesis.

SAMPLE: Randomized controlled trials, cohort studies and case-control studies comparing psychological interventions to other non-invasive interventions or no intervention.

OUTCOME MEASURES: 1) self-rated recovery; 2) functional recovery; 3) clinical outcomes; 4) administrative outcomes; and/or 5) adverse effects.

METHODS: We searched six databases from 1990 to 2015. Randomized controlled trials (RCTs), cohort studies and case-control studies meeting our selection criteria were eligible for critical appraisal. Random pairs of independent reviewers used the Scottish Intercollegiate Guideline Network criteria to critically appraise eligible studies. Studies with a low risk of bias were synthesized following best evidence synthesis principles. This study was funded by the Ministry of Finance.

RESULTS: We screened 1919 articles, 19 were eligible for critical appraisal and 10 were judged to have low risk of bias. We found no clear evidence supporting relaxation training or cognitive behavioural therapy (CBT) for persistent grade I-III NAD for reducing pain intensity or disability. Similarly, we did not find evidence to support the effectiveness of biofeedback or relaxation training for persistent grade II WAD and there is conflicting evidence for the use of CBT in this population. However, adding a progressive goal attainment program to functional restoration physiotherapy may benefit patients with persistent grade I-III WAD. Furthermore, Jyoti meditation may help reduce neck pain intensity and bothersomeness in those with persistent NAD.

CONCLUSIONS: We did not find evidence for or against the use of psychological interventions in patients with recent onset NAD or WAD. We found evidence that a progressive goal attainment program may be helpful for the management of persistent WAD and that Jyoti meditation may benefit patients with persistent NAD. The limited evidence of effectiveness for psychological interventions may be due to several factors: interventions that are ineffective, poorly conceptualized or poorly implemented. Further methodologically rigorous research is needed.

KEYWORDS: neck pain and associated disorders; outcome; psychological intervention; recovery; systematic review; whiplash-associated disorders

13. CRANIUM/TMJ

Trigeminal neuralgia

Acta Neurochir (Wien). 2015 Sep 2.

Diagnosis, medication, and surgical management for patients with trigeminal neuralgia: a qualitative study.

Allsop MJ¹, Twiddy M, Grant H, Czoski-Murray C, Mon-Williams M, Mushtaq F, Phillips N, Zakrzewska JM, Pavitt S.

[Author information](#)

Abstract

BACKGROUND:

Trigeminal neuralgia (TN) is a serious health problem, causing brief, recurrent episodes of stabbing or burning facial pain, which patients describe as feeling like an electric shock. The consequences of living with the condition are severe. There is currently no cure for TN and management of the condition can be complex, often delayed by misdiagnosis. Patients' qualitative experiential accounts of TN have not been reported in the literature. Capturing subjective experiences can be used to inform the impact of the condition on quality of life and may contribute to a better understanding of current clinical practice with the aim of improving patient care.

METHODS:

Participants with TN (n = 16; 11 female), including those who have and have not undergone surgical intervention(s), took part in one of four focus groups. We conducted a thematic analysis within an essentialist framework using transcripts.

RESULTS:

The impact of TN and treatment on the lives of participants emerged as four predominant themes: (1) diagnosis and support with TN, (2) living in fear of TN pain, (3) isolation and social withdrawal, and (4) medication burden and looking for a cure. Each theme is discussed and illustrated with extracts from the transcripts.

CONCLUSIONS:

Key issues to address in the management of patients with TN include continued delays in diagnosis, persistent side effects from medication, and a lack of psychological support. Developing strategies to enhance the management of patients with TN, informed by a biopsychosocial approach and multidisciplinary team working, is essential to enhancing the provision of current care.

PMID:26329729

Laser and gum disease/helpful

Lasers Med Sci. 2015 Sep 4.

Effect of low-level laser irradiation on proliferation and viability of human dental pulp stem cells.

Zaccara IM¹, Ginani F, Mota-Filho HG, Henriques AC, Barboza CA.
Author information

Abstract

A positive effect of low-level laser irradiation (LLLI) on the proliferation of some cell types has been observed, but little is known about its effect on dental pulp stem cells (DPSCs). The aim of this study was to identify the lowest energy density able to promote the proliferation of DPSCs and to maintain cell viability. Human DPSCs were isolated from two healthy third molars. In the third passage, the cells were irradiated or not (control) with an InGaAlP diode laser at 0 and 48 h using two different energy densities (0.5 and 1.0 J/cm²). Cell proliferation and viability and mitochondrial activity were evaluated at intervals of 24, 48, 72, and 96 h after the first laser application. Apoptosis- and cell cycle-related events were analyzed by flow cytometry. The group irradiated with an energy density of 1.0 J/cm² exhibited an increase of cell proliferation, with a statistically significant difference ($p < 0.05$) compared to the control group at 72 and 96 h. No significant changes in cell viability were observed throughout the experiment. The distribution of cells in the cell cycle phases was consistent with proliferating cells in all three groups. We concluded that LLLI, particularly a dose of 1.0 J/cm², contributed to the growth of DPSCs and maintenance of its viability. This fact indicates this therapy to be an important future tool for tissue engineering and regenerative medicine involving stem cells.

PMID:26341379

14. HEADACHES**Sleep apnea and HA's**

Medicine (Baltimore). 2015 Sep;94(36):e1506. doi: 10.1097/MD.0000000000001506.

Association of Migraine and Sleep-Related Breathing Disorder: A Population-Based Cohort Study.

Harnod T¹, Wang YC, Kao CH.
Author information

Abstract

In this nationwide population-based cohort study, we aimed to evaluate the effects of sleep-related breathing disorders (SBD) on migraine development. Patients ages 20 years or more and diagnosed with SBD between 2000 and 2009 were evaluated as the SBD cohort (n=3411), and compared with comparison cohort (n=13,644). The adjusted hazard ratio (aHR) for developing migraine was calculated in both cohorts by multivariate Cox proportional hazards model. The cumulative incidence of migraine was significantly higher in the SBD cohort than in the comparison cohort. In the SBD cohort, the overall aHR for developing migraine was 2.43 (95% confidence interval [CI]=1.72-3.44). The risk of developing migraine was higher in men (aHR 2.71) than in women (aHR 2.29) with SBD. When stratifying by age, we observed increased incidence of migraine in patients ages 20 to 44 years and 45 to 64 years, with a higher aHR of 2.51 (95% CI=1.47-4.30) and 2.68 (95% CI=1.63-4.43), respectively. The risk of developing migraine in the patients with SBD with or without comorbidity exhibited nonsignificant differences. After stratifying by the use of hypnotics, the aHR for developing migraine was 2.39 in the patients with hypnotics use and 3.58 in the patients without hypnotics use. Our findings indicate increased risk of developing migraine in adults, but not elderly ones, with SBD.
PMID: 26356720

Cognitive symptoms

Cephalalgia. 2015 Sep 8. pii: 0333102415604471.

The impact of cognitive symptoms on migraine attack-related disability.

Gil-Gouveia R¹, Oliveira AG², Martins IP³.

Author information

Abstract

BACKGROUND:

The socio-economic impact of migraine is mostly related to work loss either by absenteeism or decreased work performance. Migraine-associated cognitive dysfunction during an attack may contribute to these difficulties.

OBJECTIVE:

The objective of this article is to analyze the presence and relevance of cognitive symptoms during migraine attacks and to relate their intensity and symptom-related disability with other migraine-defining symptoms.

METHODS:

Consecutive migraine patients of a headache clinic completed diaries scoring each migraine symptom (including cognitive symptoms) intensity and symptom-related disability.

RESULTS:

Of 100 consecutive patients included in this study, 34 (all females, age average 31.8 ± 8.8 years) returned information on 229 attacks, on average 6.7 per participant. Every symptom's intensity was always rated slightly higher than the disability it caused. Pain was the symptom scored with the highest intensity and disability, followed by cognitive symptoms (difficulty in thinking and worsening with mental effort) and photo- and phonophobia. Scoring was independent of any of the clinical variables. Attack intensity and disability scores correlated with intensity and disability from pain and from worsening with mental effort.

CONCLUSIONS:

Attack-related cognitive symptoms are intense and disabling. Some attack-related cognitive symptoms correlate to intensity and disability subjectively attributed to the migraine attack. Cognitive performance should be addressed as a valuable secondary endpoint in trials of acute migraine treatment.

KEYWORDS: Migraine; cognitive symptoms; disability; headache

PMID:26350071

16. CONCUSSIONS

Rest after concussions

Research shows too much rest may compromise concussion recovery

Children's National Medical Center, 09/17/2015

According to new research, children who have had concussions should step up their activity days after injury because excessive rest itself may compromise recovery and “do more harm than good.” Physicians have often advised lengthy rest after injury, until symptoms, such as headaches, are fully cleared, which may take weeks. The rest often has an impact on school attendance, sports participation, and other activities. Latest research shows that there may be more negative psychological consequences for children who are not active, and may even contribute to persistence of post-concussive symptoms, says Marc P. DiFazio, MD, a neurologist and medical director of Children's National Ambulatory Neurology. Dr. DiFazio and other researchers' findings, “Prolonged Activity Restriction After Concussion: Are We Worsening Outcomes?” were published in *Clinical Pediatrics*.

17. SHOULDER GIRDLE**Shoulder girdle shrugging exercise****Modifying the shoulder joint position during shrugging and retraction exercises alters the activation of the medial scapular muscles**

Birgit Castelein, MsC, PT Ann Cools, PhD, PT Thierry Parlevliet, MD Barbara Cagnie, PhD, PT

Highlights

- Modifying a shrug can alter balance between scapular upward and downward rotators.
- “Shrug”, “Shrugoverhead” and “Retractionoverhead” elicited similar UT activity.
- The lowest activity of the downward rotators was during “ShrugOverhead”.
- The “RetractionOverhead” was most effective in activating medial scapular muscles.

Abstract**Background**

In patients with shoulder or neck pain, often an imbalance of the activation in the scapular upward and downward rotators is present which can cause abnormalities in coordinated scapular rotation. Shrug exercises are often recommended to activate muscles that produce upward rotation, but little information is available on the activity of the downward rotators during shrugging exercises. The position used for the shrug exercise may affect the relative participation of the medial scapular rotators.

Objectives

To compare muscle activity, using both surface and fine-wire electrodes, of the medial scapular muscles during different shoulder joint positions while performing shrug and retraction exercises.

Design

Controlled laboratory study.

Method

Twenty-six subjects performed 3 different exercises: shrug with the arms at the side while holding a weight ("Shrug"), shrug with arms overhead and retraction with arms overhead. EMG data with surface and fine wire electrodes was collected from the Upper Trapezius(UT, Levator Scapulae(LS), Middle Trapezius(MT), Rhomboid Major(RM) and Lower Trapezius(LT).

Results

The results showed that activity levels of the main medial scapular muscles depend upon the specific shoulder joint position when performing shrug and retraction exercises. High UT activity was found across all exercises, with no significant differences in UT activity between the exercises. The LS and RM activity was significantly lower during "ShrugOverhead" and the RM, MT and LT activity was significantly higher during "RetractionOverhead".

Conclusions

This study has identified that all three exercises elicited similar UT activity. LS and RM activity is decreased with the "ShrugOverhead" exercise. The "RetractionOverhead" was the most effective exercise in activating the medial scapular muscles.

Keywords:

Surface EMG, Fine-wire EMG, scapula, exercises

20 A. ROTATOR CUFF**Genetic factors**

J Shoulder Elbow Surg. 2015 Sep 5. pii: S1058-2746(15)00379-1. doi: 10.1016/j.jse.2015.07.005.

Genome-wide association study for rotator cuff tears identifies two significant single-nucleotide polymorphisms.

Tashjian RZ¹, Granger EK², Farnham JM³, Cannon-Albright LA⁴, Teerlink CC³.
Author information

Abstract

BACKGROUND:

The precise etiology of rotator cuff disease is unknown, but prior evidence suggests a role for genetic factors. Limited data exist identifying specific genes associated with rotator cuff tearing. The purpose of this study was to identify specific genes or genetic variants associated with rotator cuff tearing by a genome-wide association study with an independent set of rotator cuff tear cases.

MATERIALS AND METHODS:

A set of 311 full-thickness rotator cuff tear cases genotyped on the Illumina 5M single-nucleotide polymorphism (SNP) platform were used in a genome-wide association study with 2641 genetically matched white population controls available from the Illumina iControls database. Tests of association were performed with GEMMA software at 257,558 SNPs that compose the intersection of Illumina SNP platforms and that passed general quality control metrics. SNPs were considered significant if $P < 1.94 \times 10^{-7}$ (Bonferroni correction: 0.05/257,558).

RESULTS:

Tests of association revealed 2 significantly associated SNPs, one occurring in SAP30BP (rs820218; $P = 3.8E-9$) on chromosome 17q25 and another occurring in SASH1 (rs12527089; $P = 1.9E-7$) on chromosome 6q24.

CONCLUSIONS:

This study represents the first attempt to identify genetic factors influencing rotator cuff tearing by a genome-wide association study using a dense/complete set of SNPs. Two SNPs were significantly associated with rotator cuff tearing, residing in SAP30BP on chromosome 17 and SASH1 on chromosome 6. Both genes are associated with the cellular process of apoptosis. Identification of potential genes or genetic variants associated with rotator cuff tearing may help in identifying individuals at risk for the development of rotator cuff tearing.

KEYWORDS: Rotator cuff tear; confirmation study; genetic association
PMID: 26350878

24. ELBOW**PRP and lateral epicondylitis – on injection may be enough**

Arch Orthop Trauma Surg. 2015 Aug 30.

Platelet-rich plasma for chronic lateral epicondylitis: Is one injection sufficient?

Glanzmann MC¹, Audigé L.
Author information

Abstract

INTRODUCTION:

Chronic lateral epicondylitis is generally treated using nonsurgical methods including physiotherapy and infiltrations of cortisone or platelet-rich plasma (PRP). The latter is known for its simple application as well as associated low risk of adverse events, which lend to its widespread use in treating various musculoskeletal conditions. There is limited evidence on the effectiveness of PRP injections to optimally treat chronic lateral epicondylitis. This study explored the effectiveness of single or repeated injections for patients with symptoms that spanned 6 months or more and were unresponsive to alternate conservative measures.

METHODS AND MATERIALS:

Patients with chronic lateral epicondylitis received PRP injections in 4-week intervals that were complemented with standardized physical therapy. Patient-reported outcomes based on the patient-rated elbow evaluation (PREE), quick disabilities of the arm, shoulder and hand (qDASH), and EuroQol (five dimensions) 3-level version (EQ5D3L) questionnaires were documented at each visit including 6 months after the first injection. These outcomes were compared between patients receiving 1 vs. 2 or 3 PRP injections.

RESULTS:

Sixty-two patients received one (n = 36) or more (n = 26) PRP injections. The mean baseline to 6-month follow-up scores of the PREE and qDASH questionnaires improved significantly from 54.0 to 23.0 and 50.3 to 20.7, respectively. The mean baseline EQ5D3L-visual analogue scale score improved from 62.5 to 82.9 by 6 months post-injection. These outcomes did not significantly differ between the patients who received varying numbers of injections.

CONCLUSIONS:

Patients with chronic lateral epicondylitis reported significant pain relief and gain in function as well as quality of life 6 months after localized PRP treatment. A single PRP injection may be sufficient.

PMID: 26318887

Lateral epicondylitis and PT

BMC Musculoskelet Disord. 2015 Aug 25;16(1):223. doi: 10.1186/s12891-015-0665-4.

Efficacy of physical therapy for the treatment of lateral epicondylitis: a meta-analysis.

Weber C^{1,2}, Thai V³, Neuheuser K^{4,5}, Groover K^{6,7}, Christ O⁸.
Author information

Abstract

BACKGROUND:

Physical therapy for the treatment of lateral epicondylitis (LE) often comprises movement therapies, extracorporeal shockwave therapy (ECSWT), low level laser therapy (LLLT), low frequency electrical stimulation or pulsed electromagnetic fields. Still, only ECSWT and LLLT have been meta-analytically researched.

METHODS:

PUBMED, EMBASE and Cochrane database were systematically searched for randomized controlled trials (RCTs). Methodological quality of each study was rated with an adapted version of the Scottish Intercollegiate Guidelines Network (SIGN) checklist. Pain reduction (the difference between treatment and control groups at the end of trials) and pain relief (the change in pain from baseline to the end of trials) were calculated with mean differences (MD) and 95 %-Confidence intervals (95 % CI).

RESULTS:

One thousand one hundred thirty eight studies were identified. One thousand seventy of those did not meet inclusion criteria. After full articles were retrieved 16 studies met inclusion criteria and 12 studies reported comparable outcome variables. Analyses were conducted for overall pain relief, pain relief during maximum handgrip strength tests, and maximum handgrip strength. There were not enough studies to conduct an analysis of physical function or other outcome variables.

CONCLUSIONS:

Differences between treatment and control groups were larger than differences between treatments. Control group gains were 50 to 66 % as high as treatment group gains. Still, only treatment groups with their combination of therapy specific and non-therapy specific factors reliably met criteria for clinical relevance. Results are discussed with respect to stability and their potential meaning for the use of non-therapy specific agents to optimize patients' gain.

PMID:26303397

Lateral epicondylitis

Am J Sports Med. 2015 Sep;43(9):2133-7. doi: 10.1177/0363546515590220. Epub 2015 Jun 29.

Factors Associated With Failure of Nonoperative Treatment in Lateral Epicondylitis.

Knutsen EJ¹, Calfee RP², Chen RE², Goldfarb CA², Park KW², Osei DA³.

Author information

Abstract

BACKGROUND:

Lateral epicondylitis is a common cause of elbow pain that is treated with a variety of nonoperative measures and often improves with time. Minimal research is available on patients in whom these nonoperative treatments fail.

PURPOSE:

To identify baseline patient and disease factors associated with the failure of nonoperative treatment of lateral epicondylitis, defined as surgery after a period of nonoperative treatment.

STUDY DESIGN:

Case control study; Level of evidence, 3.

METHODS:

A total of 580 patients treated for lateral epicondylitis at a tertiary center between 2007 and 2012 were analyzed. Disease-specific and patient demographic characteristics were compared between patient groups (nonoperative vs surgical treatment). A multivariable logistic regression model was created based on preliminary univariate testing to determine which characteristics were associated with failure of nonoperative treatment.

RESULTS:

Of the 580 patients, 92 (16%) underwent surgical treatment at a mean of 6 months (range, 0-31 months) from their initial visit. Univariate analysis demonstrated a potential association ($P < .10$) between operative management and the following factors at initial diagnosis: increased age, body mass index, duration of symptoms, presence of radial tunnel syndrome, prior injection, physical therapy, splinting, smoking, workers' compensation, a labor occupation, use of narcotics, use of antidepressant medications, and previous orthopaedic surgery. In the final multivariable model, a workers' compensation claim (odds ratio [OR], 8.1), prior injection (OR, 5.6), the presence of radial tunnel syndrome (OR, 3.1), previous orthopaedic surgery (OR, 3.2), and duration of symptoms >12 months (OR, 2.5) remained significant independent predictors of surgical treatment.

CONCLUSION:

This study identifies risk factors for surgical treatment for lateral epicondylitis. While these findings do not provide information regarding causal factors associated with surgery, these patient and disease-specific considerations may be helpful when counseling patients regarding treatment options and the likelihood of the success of continued nonoperative treatment.

KEYWORDS: elbow; epicondylitis; lateral; tennis; treatment

PMID:26122386

27. HIP**Measuring hip rotation****The validity of using the posterior condylar line as a rotational reference for the femur**

Keisuke Uemura, MD Masaki Takao, MD, PhD Takashi Sakai, MD, PhD Takashi Nishii, MD, PhD Nobuhiko Sugano, MD, PhD

Abstract

Rotation of the femur is usually measured by the posterior condylar line (PCL). However, the functional position of the PCL has not been studied well. To investigate the difference between the PCL and the horizontal body line (HBL), the axial rotational position of the femur was measured using CT images, and the related factors were evaluated. The angles between the PCL and the HBL were measured on preoperative CT images of 324 hips with osteoarthritis, and the related factors were analyzed with the use of the generalized linear regression models. Of these 324 hips, CT images were also taken for 250 hips after hip arthroplasty, and the angles between the PCL and the HBL were also measured in these hips. The PCL rotated 0.4° ($\pm 10.9^{\circ}$ standard deviation) internally from the HBL on preoperative CT images, and was significantly correlated with femoral anteversion, Kellgren-Lawrence grade, and sex. On postoperative CT images, the PCL rotated 10.1° (interquartile range, 1.7° to 15.5°) internally from the HBL. There was a rotational variance in the angle between the PCL and the HBL, indicating that caution may be needed in using the PCL as a rotational reference in all patients.

Keywords: posterior condylar line, rotational reference, hip, osteoarthritis

30 A. IMPINGEMENT**Groin injuries in**

Am J Sports Med. 2015 Sep;43(9):2146-51. doi: 10.1177/0363546515591259. Epub 2015 Jul 17.

Sonographic Prevalence of Groin Hernias and Adductor Tendinopathy in Patients With Femoroacetabular Impingement.

Naal FD¹, Dalla Riva F², Wuerz TH³, Dubs B⁴, Leunig M².

Author information

Abstract

BACKGROUND: Femoroacetabular impingement (FAI) is a common debilitating condition that is associated with groin pain and limitation in young and active patients. Besides FAI, various disorders such as hernias, adductor tendinopathy, athletic pubalgia, lumbar spine affections, and others can cause similar symptoms.

PURPOSE: To determine the prevalence of inguinal and/or femoral herniation and adductor insertion tendinopathy using dynamic ultrasound in a cohort of patients with radiographic evidence of FAI.

STUDY DESIGN: Case series; Level of evidence, 4.

METHODS: This retrospective study consisted of 74 patients (36 female and 38 male; mean age, 29 years; 83 symptomatic hips) with groin pain and radiographic evidence of FAI. In addition to the usual diagnostic algorithm, all patients underwent a dynamic ultrasound examination for signs of groin herniation and tendinopathy of the proximal insertion of the adductors.

RESULTS: Evidence of groin herniation was found in 34 hips (41%). There were 27 inguinal (6 female, 21 male) and 10 femoral (9 female, 1 male) hernias. In 3 cases, inguinal and femoral herniation was coexistent. Overall, 5 patients underwent subsequent hernia repair. Patients with groin herniation were significantly older than those without (33 vs 27 years, respectively; $P = .01$). There were no significant differences for any of the radiographic or clinical parameters. Tendinopathy of the proximal adductor insertion was detected in 19 cases (23%; 11 female, 8 male). Tendinopathy was coexistent with groin herniation in 8 of the 19 cases. There were no significant differences for any of the radiographic or clinical parameters between patients with or without tendinopathy. Patients with a negative diagnostic hip injection result were more likely to have a concomitant groin hernia than those with a positive injection result (80% vs 27%, respectively). Overall, 38 hips underwent FAI surgery with satisfactory outcomes in terms of score values and subjective improvement.

CONCLUSION: The results demonstrate that groin herniation and adductor insertion tendinopathy coexist frequently in patients with FAI. Although the clinical effect is yet unclear, 5 patients underwent hernia repair. Dynamic ultrasound is a useful tool to detect such pathological abnormalities. Diagnostic hip injections can be helpful to differentiate between the sources of pain.

KEYWORDS: FAI; adductor tendinopathy; diagnostic hip injection; femoroacetabular impingement; groin pain; hernia

PMID: 26187131

Surgical management

Arthroscopy. 2015 Aug 24. pii: S0749-8063(15)00539-3. doi: 10.1016/j.arthro.2015.06.028.

Outcomes After Labral Repair in Patients With Femoroacetabular Impingement and Borderline Dysplasia.

Fukui K¹, Briggs KK², Trindade CA¹, Philippon MJ¹.

Author information

Abstract

PURPOSE:

To determine outcomes after labral repair in patients with borderline dysplasia and femoroacetabular impingement (FAI).

METHODS:

Patients with dysplasia treated between June 2005 and March 2009 were identified. The study included only patients aged 18 years or older (mean, 35 years; range, 18 to 69 years) whose affected hip had a Wiberg center-edge angle of 20° to 25° and who underwent primary hip arthroscopy performed by the senior author.

RESULTS:

One hundred two hips (100 patients, comprising 50 women and 50 men) underwent hip arthroscopy with labral repair with correction of FAI and capsular closure. Five hips were converted to total hip arthroplasty, and 7 required revision arthroscopy. Of 95 patients (representing 100 hips, 5 of which underwent total hip arthroplasty), 80 were monitored for a minimum of 2 years. At a mean follow-up point of 40 months, the preoperative modified Harris Hip Score had improved from a mean of 63.5 points (range, 20 to 98 points) to a mean of 84.9 points (range, 45 to 100 points) by the latest follow-up ($P < .001$). The mean score on the Western Ontario and McMaster Universities Arthritis Index improved from 25.3 (range, 0 to 60) to 9.7 (range, 0 to 59) ($P < .001$). The 12-Item Short Form Health Survey Physical Component Summary score also significantly improved (from 42.5 to 50.9, $P = .001$), whereas the 12-Item Short Form Health Survey Mental Health Component Summary score showed an insignificant improvement (from 52.4 to 54.1).

CONCLUSIONS:

This study showed that FAI and labral pathology can be successfully managed using hip arthroscopy, with capsular management, in patients with borderline dysplasia. Patients showed significant improvements in outcomes and high levels of satisfaction after hip arthroscopy. The need for subsequent procedures was similar to that in patients with just FAI and labral repair.

LEVEL OF EVIDENCE:

Level IV, therapeutic case series.

PMID:26315056

31. KNEE**Induced pain impedes motor function**

Arthritis Res Ther. 2015 Sep 12;17(1):259. doi: 10.1186/s13075-015-0768-1.

Experimental knee pain impairs submaximal force steadiness in isometric, eccentric, and concentric muscle actions.

Rice DA^{1,2}, McNair PJ³, Lewis GN⁴, Mannion J⁵.

Author information

Abstract

INTRODUCTION:

Populations with knee joint damage, including arthritis, have noted impairments in the regulation of submaximal muscle force. It is difficult to determine the exact cause of such impairments given the joint pathology and associated neuromuscular adaptations. Experimental pain models that have been used to isolate the effects of pain on muscle force regulation have shown impaired force steadiness during acute pain. However, few studies have examined force regulation during dynamic contractions, and these findings have been inconsistent. The goal of the current study was to examine the effect of experimental knee joint pain on submaximal quadriceps force regulation during isometric and dynamic contractions.

METHODS:

The study involved fifteen healthy participants. Participants were seated in an isokinetic dynamometer. Knee extensor force matching tasks were completed in isometric, eccentric, and concentric muscle contraction conditions. The target force was set to 10 % of maximum for each contraction type. Hypertonic saline was then injected into the infrapatella fat pad to generate acute joint pain. The force matching tasks were repeated during pain and once more 5 min after pain had subsided.

RESULTS:

Hypertonic saline resulted in knee pain with an average peak pain rating of 5.5 ± 2.1 (0-10 scale) that lasted for 18 ± 4 mins. Force steadiness significantly reduced during pain across all three muscle contraction conditions. There was a trend to increased force matching error during pain but this was not significant.

CONCLUSION:

Experimental knee pain leads to impaired quadriceps force steadiness during isometric, eccentric, and concentric contractions, providing further evidence that joint pain directly affects motor performance. Given the established relationship between submaximal muscle force steadiness and function, such an effect may be detrimental to the performance of tasks in daily life. In order to restore motor performance in people with painful arthritic conditions of the knee, it may be important to first manage their pain more effectively.

PMID: 26377678

Fatigue

J Sport Rehabil. 2015 Aug 26.

Force Sense of the Knee is Not Affected by Fatiguing the Knee Extensors and Flexors.

Allison KF¹, Sell TC, Benjaminse A, Lephart SM.
Author information

Abstract

CONTEXT:

Knee injuries commonly occur in later stages of competition indicating that fatigue may influence dynamic knee stability. Force sense (FS) is a submodality of proprioception influenced by muscle mechanoreceptors, and, if negatively affected by fatigue, may result in less effective neuromuscular control.

OBJECTIVES:

To determine the effects of peripheral fatigue on FS of the quadriceps and hamstrings.

DESIGN:

Quasi-experimental study design.

PARTICIPANTS:

Twenty healthy and physically active females and males (age: 23.4±2.7 years, mass: 69.5±10.9kg, height: 169.7±9.4cm) participated.

INTERVENTIONS:

Fatigue was induced during a protocol with two sets of 40 repetitions, and the last set truncated at 90 repetitions or stopped if torque production dropped below 25% of peak torque.

MAIN OUTCOME MEASURES:

FS of the hamstrings and quadriceps was tested on separate days before and after three sets of isokinetic knee flexion and extension to fatigue by examining the ability to produce a target isometric torque (15% MVIC) with and without visual feedback (FS Error). Electromyographic data of the tested musculature were collected in order to calculate and determine median frequency shift. T-tests and Wilcoxon Signed Rank tests were conducted to examine pre-fatigue and post-fatigue FS Error for flexion and extension.

RESULTS:

Despite verification of fatigue via torque production decrement and shift in median frequency, no significant differences were observed in FS Error for either knee flexion (pre=0.54±2.28 N·m; post=0.47±1.62 N·m) or extension (pre=-0.28±2.69 N·m; post=-0.21±1.78 N·m) pre-fatigue compared to the post-fatigue condition.

CONCLUSIONS:

Although previous research has demonstrated that peripheral fatigue negatively affects TTDP, it did not affect FS as measured in this study. The peripheral fatigue protocol may have a greater effect on the mechanoreceptors responsible for TTDP than those responsible for FS. Further investigation into the effects of fatigue across various modes of proprioception is warranted.

PMID: 26308679

32 A. KNEE/ACL

Strength important to diminish patella chondral changes

Am J Sports Med. 2015 Sep;43(9):2286-92. doi: 10.1177/0363546515588316. Epub 2015 Jun 19.

Relationship Between Quadriceps Strength and Patellofemoral Joint Chondral Lesions After Anterior Cruciate Ligament Reconstruction.

Wang HJ¹, Ao YF¹, Jiang D¹, Gong X¹, Wang YJ¹, Wang J¹, Yu JK².
Author information

Abstract

BACKGROUND: The incidence of the patellofemoral joint chondral lesions after anterior cruciate ligament reconstruction (ACLR) is disturbingly high. Few studies have assessed the factors affecting patellofemoral joint chondral lesions postoperatively.

HYPOTHESIS: The recovery of quadriceps strength after ACLR could be associated with patellofemoral joint cartilage damage.

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

METHODS: A total of 88 patients who underwent arthroscopic anatomic double-bundle ACLR with hamstring autografts received second-look arthroscopy at the time of metal staple removal at an average of 24.1 months (range, 12-51 months) postoperatively. All patients underwent standardized isokinetic strength testing for bilateral quadriceps and hamstrings 1 to 2 days before second-look arthroscopy. The patients were divided into 2 groups: Patients in group 1 had a $\geq 20\%$ deficit on the peak torque measures for quadriceps compared with that of the contralateral knee, whereas those in group 2 had a $< 20\%$ deficit on peak torque. Cartilage status at the patellofemoral joint and tibiofemoral joint were evaluated by second-look arthroscopy and the Outerbridge classification. Other assessments included the International Knee Documentation Committee (IKDC) score, Tegner and Lysholm scores, side-to-side difference on KT-2000 arthrometer, and range of motion.

RESULTS: There were 42 patients included in group 1 and 46 patients in group 2. The mean postoperative quadriceps peak torque of the involved knee compared with the contralateral knee was 70% (range, 57%-80%) in group 1 and 95% (range, 81%-116%) in group 2. For all patients, a significant worsening was seen in the patellar and trochlear cartilage ($P = .030$ and $< .001$, respectively) but not at the medial or lateral tibiofemoral joint after ACLR. A significant worsening in the status of both patellar and trochlear cartilage was seen after ACLR in group 1 ($P = .013$ and $=.011$, respectively) and of trochlear cartilage in group 2 ($P = .006$). Significantly fewer severe chondral lesions of the patella were found in group 2 than in group 1 (proportion of patients whose cartilage grade worsened: 26% vs 48%, $P < .05$; difference in cartilage grade: 0.09 vs 0.62, $P < .05$). There was no significant difference for trochlear chondral worsening between the 2 groups. No significant differences were detected between the 2 groups in terms of hamstring strength; Lysholm, Tegner, and IKDC scores; KT-2000 arthrometer anterior laxity; or range of motion.

CONCLUSION: Greater than 80% recovery of quadriceps strength after ACLR is associated with less severe patellar cartilage damage at short-term follow-up.

KEYWORDS: anterior cruciate ligament reconstruction; cartilage; patellofemoral joint; quadriceps strength; second-look arthroscopy
PMID:26093005

Restraint of ACL and MCL

Am J Sports Med. 2015 Sep;43(9):2259-69. doi: 10.1177/0363546515589165. Epub 2015 Jul 6.

Relative Strain in the Anterior Cruciate Ligament and Medial Collateral Ligament During Simulated Jump Landing and Sidestep Cutting Tasks: Implications for Injury Risk.

Bates NA¹, Nesbitt RJ², Shearn JT², Myer GD³, Hewett TE⁴.

Author information

Abstract

BACKGROUND:

The medial collateral (MCL) and anterior cruciate ligaments (ACL) are, respectively, the primary and secondary ligamentous restraints against knee abduction, which is a component of the valgus collapse often associated with ACL rupture during athletic tasks. Despite this correlation in function, MCL ruptures occur concomitantly in only 20% to 40% of ACL injuries.

HYPOTHESIS/PURPOSE:

The purpose of this investigation was to determine how athletic tasks load the knee joint in a manner that could lead to ACL failure without concomitant MCL failure. It was hypothesized that (1) the ACL would provide greater overall contribution to intact knee forces than the MCL during simulated motion tasks and (2) the ACL would show greater relative peak strain compared with the MCL during simulated motion tasks.

STUDY DESIGN:

Controlled laboratory study.

METHODS:

A 6-degrees-of-freedom robotic manipulator articulated 18 cadaveric knees through simulations of kinematics recorded from in vivo drop vertical jump and sidestep cutting tasks. Specimens were articulated in the intact-knee and isolated-ligament conditions. After simulation, each ACL and MCL was failed in uniaxial tension along its fiber orientations.

RESULTS:

During a drop vertical jump simulation, the ACL experienced greater peak strain than the MCL (6.1% vs 0.4%; $P < .01$). The isolated ACL expressed greater peak anterior force (4.8% vs 0.3% body weight; $P < .01$), medial force (1.6% vs 0.4% body weight; $P < .01$), flexion torque (8.4 vs 0.4 N·m; $P < .01$), abduction torque (2.6 vs 0.3 N·m; $P < .01$), and adduction torque (0.5 vs 0.0 N·m; $P = .03$) than the isolated MCL. During failure testing, ACL specimens preferentially loaded in the anteromedial bundle failed at 637 N, while MCL failure occurred at 776 N.

CONCLUSION:

During controlled physiologic athletic tasks, the ACL provides greater contributions to knee restraint than the MCL, which is generally unstrained and minimally loaded.

CLINICAL RELEVANCE:

Current findings support that multiplanar loading during athletic tasks preferentially loads the ACL over the MCL, leaving the ACL more susceptible to injury. An enhanced understanding of joint loading during in vivo tasks may provide insight that enhances the efficacy of injury prevention protocols.

KEYWORDS: anterior cruciate ligament injury; athletic tasks; cadaveric simulation; knee biomechanics; medial collateral ligament

PMID: 26150588

Limited hip internal rotation a factor in ACL Tear

Am J Sports Med. 2015 Sep;43(9):2233-41. doi: 10.1177/0363546515589164. Epub 2015 Jun 29.

Risk of Anterior Cruciate Ligament Fatigue Failure Is Increased by Limited Internal Femoral Rotation During In Vitro Repeated Pivot Landings.

Beaulieu ML¹, Wojtys EM², Ashton-Miller JA³.
Author information

Abstract

BACKGROUND:

A reduced range of hip internal rotation is associated with increased peak anterior cruciate ligament (ACL) strain and risk for injury. It is unknown, however, whether limiting the available range of internal femoral rotation increases the susceptibility of the ACL to fatigue failure.

HYPOTHESIS:

Risk of ACL failure is significantly greater in female knee specimens with a limited range of internal femoral rotation, smaller femoral-ACL attachment angle, and smaller tibial eminence volume during repeated in vitro simulated single-leg pivot landings.

STUDY DESIGN:

Controlled laboratory study.

METHODS:

A custom-built testing apparatus was used to simulate repeated single-leg pivot landings with a 4×-body weight impulsive load that induces knee compression, knee flexion, and internal tibial torque in 32 paired human knee specimens from 8 male and 8 female donors. These test loads were applied to each pair of specimens, in one knee with limited internal femoral rotation and in the contralateral knee with femoral rotation resisted by 2 springs to simulate the active hip rotator muscles' resistance to stretch. The landings were repeated until ACL failure occurred or until a minimum of 100 trials were executed. The angle at which the ACL originates from the femur and the tibial eminence volume were measured on magnetic resonance images.

RESULTS:

The final Cox regression model ($P = .024$) revealed that range of internal femoral rotation and sex of donor were significant factors in determining risk of ACL fatigue failure. The specimens with limited range of internal femoral rotation had a failure risk 17.1 times higher than did the specimens with free rotation ($P = .016$). The female knee specimens had a risk of ACL failure 26.9 times higher than the male specimens ($P = .055$).

CONCLUSION:

Limiting the range of internal femoral rotation during repetitive pivot landings increases the risk of an ACL fatigue failure in comparison with free rotation in a cadaveric model.

CLINICAL RELEVANCE:

Screening for restricted internal rotation at the hip in ACL injury prevention programs as well as in individuals with ACL injuries and/or reconstructions is warranted.

KEYWORDS: anterior cruciate ligament; fatigue; femoroacetabular impingement; hip; knee
PMID:26122384

Change in gait

Am J Sports Med. 2015 Sep;43(9):2277-85. doi: 10.1177/0363546515591995. Epub 2015 Aug 11.

Five-Year Changes in Gait Biomechanics After Concomitant High Tibial Osteotomy and ACL Reconstruction in Patients With Medial Knee Osteoarthritis.

Marriott K¹, Birmingham TB², Kean CO³, Hui C⁴, Jenkyn TR⁵, Giffin JR⁶.
Author information

Abstract

BACKGROUND: Concomitant high tibial osteotomy (HTO) and anterior cruciate ligament (ACL) reconstruction is a combined surgical procedure intended to improve kinematics and kinetics in the unstable ACL-deficient knee with varus malalignment and medial compartment knee osteoarthritis (OA).

PURPOSE: To investigate 5-year changes in gait biomechanics as well as radiographic and patient-reported outcomes bilaterally after unilateral, concomitant medial opening wedge HTO and ACL reconstruction.

STUDY DESIGN: Controlled laboratory study.

METHODS: A total of 33 patients (mean \pm SD age, 40 ± 9 years) with varus malalignment (mean mechanical axis angle, $-5.9^\circ \pm 2.9^\circ$), medial compartment knee OA, and ACL deficiency completed 3-dimensional gait analysis preoperatively and 2 and 5 years postoperatively. Primary outcomes were the peak external knee adduction (first peak) and flexion moments. Secondary outcomes were the peak external knee extension and transverse plane moments, peak knee angles in all 3 planes, radiographic static knee alignment measures (mechanical axis angle and posterior tibial slope), and the Knee injury and Osteoarthritis Outcome Score (KOOS).

RESULTS: There was a substantial decrease in the knee adduction moment in the surgical limb ($\%BW \times H$, -1.49; 95% CI, -1.75 to -1.22) and a slight increase in the nonsurgical limb ($\%BW \times H$, 0.16; 95% CI, 0.03 to 0.30) from preoperatively to 5 years postoperatively. There was also a decrease in the knee flexion moment for both the surgical ($\%BW \times H$, -0.67; 95% CI, -1.19 to -0.15) and nonsurgical limbs ($\%BW \times H$, -1.06; 95% CI, -1.49 to -0.64). Secondary outcomes suggested that substantial improvements were maintained at 5 years, although smaller declines were observed in several measures and in both limbs from 2 to 5 years.

CONCLUSION: Changes in the peak external moments about the knee in all 3 planes during walking were observed 5 years after concomitant medial opening wedge HTO and ACL reconstruction. These findings are consistent with an intended, sustained shift in the mediolateral distribution of knee loads.

CLINICAL RELEVANCE: These findings suggest that concomitant HTO and ACL reconstruction results in substantial changes in gait biomechanics. Future clinical research comparing treatment strategies is both warranted and required for this relatively uncommon but seemingly biomechanically efficacious procedure.

KEYWORDS: anterior cruciate ligament reconstruction; gait biomechanics; high tibial osteotomy

PMID:26264767

Athletics return to function/strength

Am J Sports Med. 2015 Sep;43(9):2242-9. doi: 10.1177/0363546515591258. Epub 2015 Jul 16.

The Influence of Quadriceps Strength Asymmetry on Patient-Reported Function at Time of Return to Sport After Anterior Cruciate Ligament Reconstruction.

Zwolski C¹, Schmitt LC², Quatman-Yates C³, Thomas S⁴, Hewett TE⁵, Paterno MV³.

Author information

Abstract

BACKGROUND: An objective assessment of quadriceps strength after anterior cruciate ligament reconstruction (ACLR) is an important clinical measure to determine readiness to return to sport (RTS). Not all clinicians are equipped with the means to objectively quantify quadriceps strength limb symmetry indices (Q-LSIs) via lower extremity isokinetic dynamometers, as recommended by previous studies.

PURPOSE/HYPOTHESIS: The purpose of this study was to determine whether the International Knee Documentation Committee 2000 Subjective Knee Form (IKDC) score at time of RTS was a predictor of quadriceps strength in a young, athletic population after ACLR. Two hypotheses were tested: (1) Individuals with higher self-reports of function would demonstrate better quadriceps strength of the involved limb than individuals with lower self-reports of function at the time of RTS, and (2) individuals with higher self-reports of function would have normal quadriceps strength limb symmetry.

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

METHODS: At time of RTS, 139 subjects who had undergone ACLR completed the IKDC. In addition, an isometric quadriceps strength test (Biodex dynamometer) was performed on both lower extremities. Peak torques were calculated, as was the Q-LSI, determined by the formula (involved limb peak torque/uninvolved limb peak torque) × 100%. Participants were dichotomized based on IKDC scores: high IKDC (IKDC ≥90) and low IKDC (IKDC <90). Two-way analysis of variance was used to determine the effect of limb (involved vs uninvolved) and group (high vs low IKDC) on isometric quadriceps strength. Chi-square and logistic regression analyses were then performed to determine whether IKDC scores could predict Q-LSI.

RESULTS: At time of RTS, a significant correlation between IKDC scores and (1) peak isometric torque ($r = 0.282$, $P < .001$) and (2) Q-LSI ($r = 0.357$, $P < .001$) was observed. Individuals with IKDC scores ≥90 were 3 times (OR = 3.4; 95% CI, 1.71-6.93) more likely to demonstrate higher Q-LSI (≥90%). An IKDC score ≥94.8 predicted Q-LSI ≥90% with high sensitivity (0.813) and moderate specificity (0.493).

CONCLUSION: Participants with higher IKDC scores demonstrated an increased likelihood of presenting with greater involved limb quadriceps strength and better Q-LSI. Based on the results of this study, a patient-reported outcome measure, such as the IKDC, may be able to serve as a valuable screening tool for the identification of quadriceps strength deficits in this population; however, it should not be considered an accurate surrogate for isokinetic dynamometry. Furthermore, a score of ≥94.8 on the IKDC is likely to indicate that a patient's quadriceps strength is at an acceptable RTS level.

KEYWORDS: ACL reconstruction; IKDC; patient-reported outcomes; quadriceps strength; return to sport

PMID: 26183172

Patella tendon 20 year results good

Am J Sports Med. 2015 Sep;43(9):2164-74. doi: 10.1177/0363546515591263. Epub 2015 Jul 17.

Twenty-Year Outcomes of a Longitudinal Prospective Evaluation of Isolated Endoscopic Anterior Cruciate Ligament Reconstruction With Patellar Tendon Autografts.

Thompson S¹, Salmon L¹, Waller A¹, Linklater J², Roe J³, Pinczewski L⁴.

Author information

Abstract

BACKGROUND: Long-term prospective follow-up studies of single-incision endoscopic anterior cruciate ligament (ACL) reconstruction are limited and may include confounding factors.

PURPOSE: This longitudinal prospective study reports the outcomes of isolated ACL reconstruction using middle-third patellar tendon autografts in 90 patients over 20 years.

STUDY DESIGN: Case series; Level of evidence, 4.

METHODS: Between January 1993 and April 1994, a total of 90 patients met study inclusion criteria: evaluation at 1, 2, 3, 4, 5, 7, 10, 15, and 20 years after surgery. Exclusion criteria were associated ligamentous injuries requiring surgery, previous meniscectomy or meniscal injuries requiring more than one-third meniscectomy, chondral injuries, and an abnormal contralateral knee.

RESULTS: At 20 years, 32 (36%) patients had sustained another ACL injury: 8 (9%) to the index limb and 27 (30%) to the contralateral limb (3 injuring both knees). The mean International Knee Documentation Committee (IKDC) score was 86. Of the patients, 50% participated in strenuous/very strenuous activities, and kneeling pain was present in 63%. Radiographic degenerative change was found in 61%; 20% had IKDC grade C, and 0% had grade D. The IKDC clinical examination revealed that 95% had a normal/nearly normal knee. Significant sex differences existed: when compared with male patients, female patients were less likely to reinjure the reconstructed ACL (18% vs 2%, respectively; $P = .01$), reported poorer IKDC subjective scores (90 vs 83, respectively; $P = .03$), had more activity-related pain (20% vs 57%, respectively; $P = .02$), and were less likely to participate in strenuous activities (66% vs 35%, respectively; $P = .009$). ACL graft survival was not related to age. Patients <18 years old had an increased odds ratio (3.2) for rupturing the contralateral ACL. A coronal graft angle <17° increased the risk of failure compared with an angle >17° (77% vs 96% survival, respectively) by a factor of 8.5.

CONCLUSION: Injuries more commonly occurred in the contralateral ACL than in the reconstructed ACL graft, and the most significant predictor of a contralateral ACL injury was age <18 years. The most significant predictor of an ACL graft rupture was a coronal graft angle <17°. Female patients had lower rerupture rates, poorer subjective scores, and decreased participation in strenuous activities, putting the graft at a lower risk of failure. Kneeling pain remained persistent over 20 years. Radiographic osteoarthritis was evident in 61% of patients, but symptomatic osteoarthritic symptoms were rarely reported.

KEYWORDS: anterior cruciate ligament (ACL); knee; long-term outcome; reconstruction
PMID: 26187130

Biomechanical assessment for replacement

Am J Sports Med. 2015 Sep;43(9):2189-97. doi: 10.1177/0363546515589166. Epub 2015 Jun 19.

Biomechanical Analysis of Simulated Clinical Testing and Reconstruction of the Anterolateral Ligament of the Knee.

Spencer L¹, Burkhart TA², Tran MN¹, Rezanoff AJ¹, Deo S¹, Catherine S³, Getgood AM⁴.
Author information

Abstract

BACKGROUND:

Anatomic anterolateral ligament (ALL) reconstruction has been proposed to assist anterior cruciate ligament (ACL) reconstruction in controlling anterolateral rotational laxity of the knee. However, the biomechanical effects have not been reported.

PURPOSE:

(1) To investigate the effect of ALL transection on rotational knee kinematics and (2) to determine the effect on knee biomechanics of ALL reconstruction procedures compared with lateral extra-articular tenodesis (LET).

STUDY DESIGN:

Controlled laboratory study.

METHODS:

A total of 12 cadaveric knee specimens were tested in the following sequence: (1) ACLintact, (2) anteromedial bundle of ACL sectioned (ACLamb), (3) complete ACL sectioned (ACLfull), (4) ALL sectioned (ALLsec), (5) anatomic ALL reconstruction (ALLanat), and (6) LET. Biomechanical anterior drawer and Lachman tests were performed in which a 90-N load was applied to the posterior tibia, and anterior translation was measured. A combined load to simulate the early phase of the pivot-shift test was executed in which a 5-N·m internal rotation moment was applied to a fully extended knee; anterior translation and internal rotation were measured.

RESULTS:

Anterior translation increased across conditions for the biomechanical tests. Internal rotation during the simulated early-phase pivot-shift test was significantly different between ACLfull and ALLsec. Anatomic ALL reconstruction did not significantly reduce internal rotation or anterior translation during the simulated early-phase pivot-shift test. After LET, a significant decrease in anterior translation was found. There was no evidence of overconstraint of the knee with either anatomic ALL reconstruction or LET.

CONCLUSION:

The ALL demonstrated a role in controlling anterolateral laxity. LET had a composite effect in governing both anterior and rotational laxity. Anatomic ALL reconstruction did not reduce anterolateral rotational laxity.

CLINICAL RELEVANCE:

Profiling the biomechanical characteristics of anterolateral reconstruction is integral to understanding the implications and potential benefit of such an additional procedure to ACL reconstruction.

KEYWORDS: anterior cruciate ligament; anterolateral ligament; biomechanical analysis; lateral extra-articular tenodesis

PMID: 26093007

Female predisposition to ACL injuries

Curr Sports Med Rep. 2015 Sep-Oct;14(5):368-72. doi: 10.1249/JSR.0000000000000188.

Anatomic Factors that May Predispose Female Athletes to Anterior Cruciate Ligament Injury.

Cheung EC¹, Boguszewski DV, Joshi NB, Wang D, McAllister DR.
Author information

Abstract

Female athletes are 2 to 10 times more likely to injure their anterior cruciate ligaments (ACL) than male athletes. There has been greater recognition of this gender discrepancy because female participation in competitive athletics has increased. Previous investigators have divided risk factors into hormonal, neuromuscular response, and anatomic subgroups. Gender variation within these groups may help explain the higher incidence of ACL injury in women. The purpose of this article is to review research examining female-specific anatomy that may predispose women to ACL injury. Specifically, we discuss how women may have increased tibial and meniscal slopes, narrower femoral notches, and smaller ACL, which may place the ACL at risk from injury. These anatomic factors, combined with other female-specific risk factors, may help physicians and researchers better understand why women appear to be more prone to ACL injury.

PMID: 26359837

Protocols

J Sport Rehabil. 2015 Aug 26.

Quadriceps and Hamstring Strength Recovery During Early Period of Neuromuscular Rehabilitation Following ACL Hamstring Tendon Autograft Reconstruction.

Harput G¹, Kilinc HE, Ozer H, Baltaci G, Mattacola CG.
Author information

Abstract

CONTEXT:

There is lack of information related to quadriceps and hamstring strength recovery during the early period of the rehabilitation following anterior cruciate ligament reconstruction (ACLR) using hamstring tendon graft (HTG).

OBJECTIVE:

The aim of this study was to investigate quadriceps and hamstring isometric strength at 4, 8 and 12 week time points following ACLR and to document the strength changes of these muscles over time.

DESIGN:

Longitudinal study.

PARTICIPANTS:

Twenty four patients (age: 28.1±8.1 yrs) who underwent unilateral single bundle anatomic ACLR with 4-strand semitendinosus and gracilis tendon graft were enrolled in this study.

MAIN OUTCOME MEASURES:

The isometric strength of quadriceps and hamstring muscles were measured on an isokinetic dynamometer at 60° knee flexion angle at 4, 8 and 12 weeks after surgery.

RESULTS:

Quadriceps and hamstring strength significantly increased over time for both the involved limb (Quadriceps: $F(2,46)=58.3$, $p<0.001$, Hamstring: $F(2,46)=35.7$, $p<0.001$) and uninvolved limb (Quadriceps: $F(2,46)=17.9$, $p<0.001$, Hamstring: $F(2,46)=56.9$, $p=0.001$). Quadriceps and hamstring indexes significantly changed from 4 weeks (QI:57.9, HI:54.4) to 8 weeks(QI:78.8, HI:69.9) and from 8 weeks to 12 weeks (QI:82, HI:75.7) ($p<0.001$); however, there was no difference between indexes at the 12-week time point ($p=0.17$).

CONCLUSIONS:

The results of this study serve as a reference for clinicians while directing a rehabilitation protocol for ACLR patients with HTG to better appreciate expected strength changes of the muscles in the early phase of recovery.

PMID: 26308906

33. MENISCUS**Age and meniscus repair**

Am J Sports Med. 2015 Sep;43(9):2222-7. doi: 10.1177/0363546515591260. Epub 2015 Jul 17.

Meniscus Suture Repair: Minimum 10-Year Outcomes in Patients Younger Than 40 Years Compared With Patients 40 and Older.

Steadman JR¹, Matheny LM¹, Singleton SB¹, Johnson NS¹, Rodkey WG¹, Crespo B¹, Briggs KK².

Author information

Abstract

BACKGROUND: Few studies have compared outcomes after meniscus suture repair in patients younger than 40 years versus patients 40 years and older.

PURPOSE: To document failure rates and long-term outcomes after meniscus suture repair by a single surgeon, using the inside-out technique, at a minimum 10-year follow-up in patients younger than 40 years versus those 40 years and older.

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

METHODS: This study included all patients 18 years or older who underwent meniscus suture repair with the inside-out technique by a single surgeon between January 1992 and December 2003. Patients were divided into 2 cohorts according to age: <40 years (cohort 1) and ≥40 years (cohort 2). If patients underwent subsequent knee surgery, all subsequent reports, whether performed by the original treating surgeon or by a different surgeon elsewhere, were reviewed by 2 independent reviewers not involved in the primary care of the patients. Reviewers classified surgeries as failures if the subsequent surgery treated the same area of the meniscus as repaired in the index surgery. Patients completed a subjective questionnaire at minimum of 10 years after arthroscopy. Outcomes measures included Lysholm, Tegner, and patient satisfaction with outcome. All data were collected prospectively.

RESULTS: The surgeon performed 339 meniscus repairs between 1992 and 2003. The study included 181 knees in 178 patients, who had a mean age of 33 years (range, 18-70 years). Cohort 1 contained 136 knees; 16 patients (12%) were lost to follow-up and 47 (35%) underwent a subsequent knee arthroscopy. Cohort 2 contained 45 knees; 2 patients (4.4%) were lost to follow-up, 3 patients had a total knee arthroplasty, and 12 patients (28%) underwent a subsequent knee arthroscopy. In cohort 1, the meniscus repair failure rate was 5.5% (6/110), and in cohort 2 it was 5.3% (2/38) ($P = .927$). There was no significant difference in failure rate based on which meniscus was repaired ($P = .257$), concomitant anterior cruciate ligament (ACL) reconstruction ($P = .092$), or microfracture ($P = .674$). Average follow-up time for cohort 1 was 16.1 years (range, 10.0-21.9 years), with 82% follow-up ($n = 73/89$); average follow-up time for cohort 2 was 16.2 years (range, 10.1-21.0 years), with 93% follow-up ($n = 28/30$). There were no significant differences in outcomes scores after meniscus suture repair based on age cohort or meniscus side, presence of an ACL tear, or concomitant microfracture procedure.

CONCLUSION: Meniscus repair failure rate was not different in patients who were younger than 40 years versus those who were 40 years or older at time of meniscus index surgery. Patients who underwent meniscus suture repair had high function and high patient satisfaction at an average of 16 years after meniscus suture repair, and no differences were seen based on age.

KEYWORDS: meniscus suture repair; outcomes; over 40 years old; revision
PMID:26187129

34. PATELLA**Patella pain and strapping**

Scand J Med Sci Sports. 2015 Sep 17. doi: 10.1111/sms.12556.

Effect of patellar strap and sports tape on pain in patellar tendinopathy: A randomized controlled trial.

de Vries A¹, Zwerver J¹, Diercks R¹, Tak I², van Berkel S³, van Cingel R⁴, van der Worp H¹, van den Akker-Scheek I¹.

Author information

Abstract

Numerous athletes with patellar tendinopathy (PT) use a patellar strap or sports tape during sports. This study's aim was to investigate the short-term effect of these orthoses on patellar tendon pain. Participants performed the single-leg decline squat, vertical jump test, and triple-hop test under four different conditions (patellar strap, sports tape, placebo, and control). Subsequently, participants practiced sports as usual for 2 weeks; during 1 week, they were assigned to one of the four conditions. Pain was measured with the visual analog scale (VAS). In total, 97 athletes with PT [61% male, age 27.0 (SD8.1), VISA-P 58.5 (SD12.7)] were analyzed. On the single-leg decline squat, the VAS pain score reduced significantly in the patellar strap (14 mm, $P = 0.04$) and the sports tape condition (13 mm, $P = 0.04$), compared with control, but not placebo. A significant decrease in VAS pain during sports was found in the sports tape (7 mm, $P = 0.04$) and placebo group (6 mm, $P = 0.04$).

The VAS pain score two hours after sports decreased significantly in the patellar strap, sports tape and placebo group (8-mm, $P < 0.001$, 10 mm, $P = 0.001$ and 7 mm, $P = 0.03$, respectively). This study's findings indicate that an orthosis (including placebo tape) during sports can reduce pain in PT patients in the short term.

KEYWORDS: Jumper's knee; brace; patellar tendon; prevention

PMID:26376953

Multiple treatment options

Osteoarthritis Cartilage. 2015 Sep;23(9):1457-64. doi: 10.1016/j.joca.2015.04.024. Epub 2015 May 7.

Exercise, education, manual-therapy and taping compared to education for patellofemoral osteoarthritis: a blinded, randomised clinical trial.

Crossley KM¹, Vicenzino B², Lentzos J³, Schache AG³, Pandy MG³, Ozturk H³, Hinman RS⁴.
Author information

Abstract

OBJECTIVE:

Patellofemoral joint osteoarthritis (PFJ OA) contributes considerably to knee OA symptoms. This study aimed to determine the efficacy of a PFJ-targeted exercise, education manual-therapy and taping program compared to OA education alone, in participants with PFJ OA.

METHODS:

A randomised, participant-blinded and assessor-blinded clinical trial was conducted in primary-care physiotherapy. 92 people aged ≥ 40 years with symptomatic and radiographic PFJ OA participated. Physiotherapists delivered the PFJ-targeted exercise, education, manual-therapy and taping program, or the OA-education (control condition) in eight sessions over 12 weeks. Primary outcomes at 3-month (primary) and 9-month follow-up: (1) patient-perceived global rating of change (2) pain visual analogue scale (VAS) (100 mm); and (3) activities of daily living (ADL) subscale of the Knee injury and Osteoarthritis Outcome Score (KOOS).

RESULTS:

81 people (88%) completed the 3-month follow-up and data analysed on an intention-to-treat basis. Between-group baseline similarity for participant characteristics was observed. The exercise, education, manual-therapy and taping program resulted in more people reporting much improvement (20/44) than the OA-education group (5/48) (number needed to treat 3 (95% confidence interval (CI) 2 to 5)) and greater pain reduction (mean difference: -15.2 mm, 95% CI -27.0 to -3.4). No significant effects on ADL were observed (5.8; 95% CI -0.6 to 12.1). At 9 months there were no significant effects for self-report of improvement, pain (-10.5 mm, 95% CI -22.7 to 1.8) or ADL (3.0, 95% CI -3.7 to 9.7).

CONCLUSION:

Exercise, education, manual-therapy and taping can be recommended to improve short-term patient rating of change and pain severity. However over 9-months, both options were equivalent.

TRIAL REGISTRATION:

Australian New Zealand Clinical Trials Registry (ACTRN12608000288325):
<https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=82878>.

KEYWORDS: Exercise-therapy; Knee; Patella; Physiotherapy; Rehabilitation

PMID: 25960116

Patella dislocation exercise rehab. VMO important

Knee. 2015 Sep;22(4):313-20. doi: 10.1016/j.knee.2015.03.013. Epub 2015 Apr 25.

Rehabilitation following first-time patellar dislocation: a randomised controlled trial of purported vastus medialis obliquus muscle versus general quadriceps strengthening exercises.

Smith TO¹, Chester R², Cross J², Hunt N³, Clark A⁴, Donell ST⁵.

Author information

Abstract

BACKGROUND:

We aimed to define whether distal vastus medialis (VM) muscle strengthening improves functional outcomes compared to general quadriceps muscle strengthening following first-time patellar dislocation (FTPD).

METHODS:

Fifty patients post-FTPD were randomised to either a general quadriceps exercise or rehabilitation programme (n=25) or a specific-VM exercise and rehabilitation regime (n=25). The primary outcome was the Lysholm knee score, and secondary outcomes included the Tegner Level of Activity score, the Norwich Patellar Instability (NPI) score, and isometric knee extension strength at various knee flexion ranges of motion. Outcomes were assessed at baseline, six weeks, six months and 12months.

RESULTS:

There were statistically significant differences in functional outcome and activity levels with the Lysholm knee score and Tegner Level of Activity score at 12months in the general quadriceps exercise group compared to the VM group (p=0.05; 95% confidence interval (CI): -14.0 to 0.0/p=0.04; 95% CI: -3.0 to 0.0). This did not reach a clinically important difference. There was no statistically significant difference between the groups for the NPI score and isometric strength at any follow-up interval. The trial experienced substantial participant attrition (52% at 12months).

CONCLUSIONS:

Whilst there was a statistical difference in the Lysholm knee score and Tegner Level of Activity score between general quadriceps and VM exercise groups at 12months, this may not have necessarily been clinically important. This trial highlights that participant recruitment and retention are challenges which should be considered when designing future trials in this population.

LEVEL OF EVIDENCE: Therapeutic study, Level I.

KEYWORDS: Exercise; Patellar dislocation; Quadriceps; Trial; Vastus medialis oblique

PMID: 25921095

Medial patella ligament

Am J Sports Med. 2015 Sep;43(9):2198-207. doi: 10.1177/0363546515597906. Epub 2015 Aug 19.

The Ability of Medial Patellofemoral Ligament Reconstruction to Correct Patellar Kinematics and Contact Mechanics in the Presence of a Lateralized Tibial Tubercle.

Stephen JM¹, Dodds AL¹, Lumpaopong P², Kader D³, Williams A⁴, Amis AA⁵.

Author information

Abstract

BACKGROUND: Tibial tubercle (TT) transfer and medial patellofemoral ligament (MPFL) reconstruction are used after patellar dislocations. However, there is no objective evidence to guide surgical decision making, such as the ability of MPFL reconstruction to restore normal behavior in the presence of a lateralized TT.

HYPOTHESIS: MPFL reconstruction will only restore joint contact mechanics and patellar kinematics for TT-trochlear groove (TG) distances up to an identifiable limit.

STUDY DESIGN: Controlled laboratory study.

METHODS: Eight fresh-frozen cadaveric knees (mean TT-TG distance, 10.4 mm) were placed on a testing rig. Individual quadriceps heads and the iliotibial band were loaded with 205 N in physiological directions using a weighted pulley system. Patellofemoral contact pressures and patellar tracking were measured at 0°, 10°, 20°, 30°, 60°, and 90° of flexion using pressure-sensitive film and an optical tracking system. The MPFL attachments were marked. TT osteotomy was performed, and a metal T-plate was fixed to the anterior tibia with holes at 5-mm intervals for TT fixation. The anatomic TT position was restored after plate insertion. The TT was lateralized in 5-mm intervals up to 15 mm, with pressure and tracking measurements recorded. The MPFL was transected and all measurements repeated before and after MPFL reconstruction using a double-stranded gracilis tendon graft. Data were analyzed using repeated-measures ANOVA, Bonferroni post hoc analysis, and paired t tests.

RESULTS: MPFL transection significantly elevated lateral patellar tilt and translation and reduced mean medial contact pressures during early knee flexion. These effects increased significantly with TT lateralization. MPFL reconstruction restored patellar translation and mean medial contact pressures to the intact state when the TT was in anatomic or 5-mm lateralized positions. However, these were not restored when the TT was lateralized by 10 mm or 15 mm. Patellar tilt was restored after 5-mm TT lateralization but not after 10-mm or 15-mm lateralization.

CONCLUSION: Considering the mean TT-TG distance in this study (10.4 mm), findings suggest that in patients with TT-TG distances up to 15 mm, patellofemoral kinematics and contact mechanics can be restored with MPFL reconstruction. However, for TT-TG distances greater than 15 mm, more aggressive surgery such as TT transfer may be indicated.

CLINICAL RELEVANCE: This provides guidance to surgeons as to the threshold at which MPFL reconstruction may satisfactorily restore patellofemoral mechanics, beyond which more invasive surgery such as TT transfer may be indicated.

KEYWORDS: MPFL reconstruction; contact pressures; patellar instability; patellofemoral tracking; surgery; tibial tubercle–trochlear groove (TT-TG)

PMID: 26290576

Need for exercise protocol**Patellofemoral pain: challenging current practice – a case report**

Benjamin E. Smith Paul Hendrick Pip Logan

DOI: <http://dx.doi.org/10.1016/j.math.2015.09.002>

Highlights

- This case report describes a patient with long term severe and debilitating PFP
- Rehabilitation was based upon neurophysiology of pain
- Descriptions of tissue based pathology models of pain were actively challenged
- Exercises were purposely designed to elicit pain
- The patient achieved 80% improvement in his symptoms and a return to sport

Abstract

Patellofemoral pain (PFP) is a common problem in young people, with 1 in 6 suffering at any one time. It is unclear which management approach is the optimal method for treating PFP in the long term, with traditional physiotherapy examination focusing on assessing for specific structural dysfunction. A rationale for a different assessment and treatment approach, one that moves the focus away from a biomedical/tissue pathology model towards one directed at the neurophysiology of pain, has been suggested.

The patient was a 21 year old male with a 6 year history of PFP with previous failed physiotherapeutic treatment. He reported previous multiple healthcare practitioners' advice to avoid activities that were painful as reasons for being unable to participate in sporting activities. No specific structural testing was performed, such as specific muscle strength, length, foot position, patella movement and position, or movement patterns.

Descriptions of tissue based pathology models of pain, e.g. patella mal-tracking, were actively discouraged and challenged. The patient was taught to perform one uncomfortable/painful exercise as part of his rehabilitation programme twice a day.

The patient achieved 80% improvement in his symptoms over 7 appointments and a return to physical activity following a 5 month rehabilitation programme purposely designed to elicit pain by means of gradually exercising and loading the tissues. This case report highlights the need for further research into exercise protocols for patients suffering with PFP based upon neurophysiology models of pain.

Keywords:

Patellofemoral, PFP, anterior knee pain

37. OSTEOARTHRITIS/KNEE**Mesenchymal stems cells helps with OA**

Am J Sports Med. 2015 Sep;43(9):2293-301. doi: 10.1177/0363546515588317. Epub 2015 Jun 25.

Mesenchymal Stem Cell Implantation in Knee Osteoarthritis: An Assessment of the Factors Influencing Clinical Outcomes.

Kim YS¹, Choi YJ¹, Koh YG².

Author information

Abstract

BACKGROUND:

Several clinical studies have reported on cell-based treatment using mesenchymal stem cells (MSCs) for cartilage regeneration in knee osteoarthritis (OA). However, little is known about the factors that influence the clinical outcomes after surgery.

PURPOSE/HYPOTHESIS:

This study aimed to investigate the clinical outcomes of MSC implantation in patients with knee OA and assess the factors that are associated with clinical outcomes. The hypothesis was that factors may exist that could influence clinical outcomes.

STUDY DESIGN:

Case series; Level of evidence, 4.

METHODS:

A total of 49 patients (55 knees) were retrospectively evaluated after MSC implantation for knee OA. The inclusion criteria were patients who had an isolated full-thickness cartilage lesion and Kellgren-Lawrence OA grade 1 or 2. Clinical outcomes were measured with the International Knee Documentation Committee (IKDC) score, Tegner activity score, and patients' overall satisfaction with the surgery. Statistical analyses were performed to determine the effect of different factors on the clinical outcome.

RESULTS:

The mean pre- and postoperative IKDC and Tegner activity scores significantly improved from 37.7 ± 6.3 to 67.3 ± 9.5 (IKDC) and from 2.2 ± 0.7 to 3.8 ± 0.7 (Tegner) ($P < .001$ for both). Twenty-four patients reported their overall satisfaction with the surgery as excellent (43.6%), 17 as good (30.9%), 11 as fair (20.0%), and 3 as poor (5.5%). There were significant differences in clinical outcomes at the final follow-up among the age and lesion size groups ($P < .05$ for all). Multivariate analyses showed high prognostic significance related to patient age and lesion size, and scatter plots suggested a cutoff age of 60 years and a cutoff lesion size of 6.0 cm² for the optimum identification of poor clinical outcomes ($P < .05$ for both).

CONCLUSION:

The clinical outcomes of MSC implantation for knee OA are encouraging. Patient age and lesion size are important factors that affect clinical outcomes; thus, these may serve as a basis for preoperative surgical decisions. Cutoff points exist for the risk of clinical failure in patients older than 60 years and those with a lesion size larger than 6.0 cm².

KEYWORDS: implantation; knee; mesenchymal stem cell; osteoarthritis; prognostic factors
PMID: 26113522

40. ANKLE SPRAINS AND INSTABILITY**Balance training with BAPS**

J Sport Rehabil. 2015 Aug 26.

Effects of a Four Week Biomechanical Ankle Platform System Protocol on Balance in High School Athletes with Chronic Ankle Instability.

Cain MS¹, Garceau SW, Linens SW.
Author information

Abstract

CONTEXT:

Chronic Ankle Instability (CAI) describes the residual symptoms present after repetitive ankle sprains. Current rehabilitation programs in the high school population focus on a multi-station approach or general lower extremity injury prevention program. Specific rehabilitation techniques for CAI have not been established.

OBJECTIVE:

To determine the effectiveness of a 4-week Biomechanical Ankle Platform System (BAPS) Board protocol on balance of high school athletes with CAI.

DESIGN:

Randomized control trial.

SETTING:

Athletic Training Facility Patients: Twenty-two high school athletes with "giving way" and a history of ankle sprains (i.e. CAI) were randomized into a rehabilitation (REH) (166.23±0.93cm, 67.0±9.47kg, 16.45±0.93yrs) or control (CON) (173.86±8.88cm, 84.51±21.28kg, 16.55±1.29yrs) group.

INTERVENTIONS:

After baseline measures, the REH group completed a progressive BAPS rehabilitation program (3 times a week for 4 weeks) whereas the CON group had no intervention. Each session consisted of 5 trials of clockwise/counterclockwise rotations changing direction every 10 seconds during each 40 second trial. After four weeks, baseline measurements were repeated.

MAIN OUTCOME MEASURES:

Dependent measures included longest time (Time In Balance Test), average number of errors (Foot Lift Test), average reach distance (cm) normalized to leg length for each reach direction (Star Excursion Balance Test) and fastest time (Side Hop Test).

RESULTS:

Significant group by time interactions were found for TIB (F1,20=9.89, P=0.005), FLT (F1,20=41.18, P<0.001), SEBT-AM (F1,20=5.34, P=0.032), SEBT-M (F1,20=7.51, P=0.013), SEBT-PM (F1,20=12.84, P=0.002), SHT (F1,20=7.50, P=0.013). Post-hoc testing showed that the REH group improved performance on all measures at posttest, whereas the CON group did not.

CONCLUSIONS:

A 4-week BAPS rehabilitation protocol improved balance in high school athletes suffering from CAI. These results can allow clinicians to rehabilitate in a focused manner by utilizing one rehabilitation tool that allows benefits to be accomplished in a shorter time period.

42. PLANTAR SURFACE**Taping and plantar Fasciitis**

J Phys Ther Sci. 2015 Aug;27(8):2491-3. doi: 10.1589/jpts.27.2491. Epub 2015 Aug 21.

Effects of the application of Low-Dye taping on the pain and stability of patients with plantar fasciitis.

Park C¹, Lee S², Lim DY³, Yi CW⁴, Kim JH⁵, Jeon C⁶.

Author information

Abstract

[Purpose] This study examined how the application of Low-Dye (LD) taping affected the pain and stability of patients with plantar fasciitis. [Subjects] The subjects were 30 patients with plantar fasciitis who were divided into two groups: a Low-Dye taping group (LTG, n=15) and a conservative treatment group (CTG, n=15). [Methods] The treatments were performed three times a week for six weeks in both groups. A visual analog scale (VAS) was used to evaluate the pain and stability of patients with plantar fasciitis, and the transfer area of the center of gravity (TAOCOG) was measured to evaluate stability using a BioRescue device. [Results] In the within-group comparison of the VAS, the LTG and CTG values significantly decreased. In the post-test between-group comparison, the VAS pain decreased more significantly in LTG than in CTG. In the within-group comparison of the TAOCOG, the LTG value significantly increased. In the post-test between-group comparison, the TAOCOG value increased more significantly than in LTG than in CTG. [Conclusion] Utilizing Low-Dye taping for patients with plantar fasciitis appears to be an effective intervention method for reducing pain and enhancing stability.

KEYWORDS: Low-Dye taping; Plantar fasciitis; Stability

PMID:2635530

45 B. MANUAL THERAPY CERVICAL**TMJ MT**

Phys Ther. 2015 Aug 20.

Effectiveness of Manual Therapy and Therapeutic Exercise for Temporomandibular Disorders: Systematic Review and Meta-Analysis.

Armijo-Olivo S¹, Pitance L², Singh V³, Neto F⁴, Thie N⁵, Michelotti A⁶.
Author information

Abstract

BACKGROUND:

Manual therapy and exercise have been extensively used to treat musculoskeletal conditions such as Temporomandibular disorders (TMD). The evidence regarding their effectiveness provided by early systematic reviews is outdated.

PURPOSE:

Summarize evidence from and evaluate the methodological quality of randomized controlled trial's (RCT) that examined the effectiveness of manual therapy (MT) and therapeutic exercise interventions when compared with other active interventions or standard care for treatment of TMD.

DATA SOURCES:

Electronic data searches were performed including 6 databases in addition to manual search.

STUDY SELECTION:

RCTs involving adults with TMD, comparing any type of MT intervention (e.g. mobilization, manipulation) or exercise therapy compared to a placebo intervention, controlled comparison intervention, or standard care were included. The main outcomes of this systematic review were pain, range of motion and oral function. 48 studies met the inclusion criteria and were analyzed.

DATA EXTRACTION:

Data were extracted in duplicate on specific study characteristics.

DATA SYNTHESIS:

The overall evidence for this systematic review was considered low. The trials included in this review had unclear or high risk of bias. Thus, the evidence was generally downgraded based on risk of bias assessments. Most of the effect sizes were low to moderate with no clear indication of superiority of exercises vs. other conservative treatments to treat TMD. However, MT alone or in combination with exercises at the jaw or cervical level showed promising effects.

LIMITATIONS:

quality of the evidence, and heterogeneity of studies **CONCLUSIONS:** No high quality evidence was found, indicating that there is great uncertainty about the effectiveness of exercise and manual therapy for TMD.

PMID: 26294683

45 D. MANUAL THERAPY EXTREMITIES**Adhesive capsulitis treatment**

Arch Phys Med Rehabil. 2015 Aug 15. pii: S0003-9993(15)01066-7. doi: 10.1016/j.apmr.2015.07.025.

The efficacy of different types of mobilization techniques in patients with primary adhesive capsulitis of the shoulder: a systematic review.

Noten S¹, Meeus M², Stassijns G³, Van Glabbeek F⁴, Verborgt O⁵, Struyf F⁶.
Author information

Abstract

OBJECTIVE:

To systematically review the literature for efficacy of isolated articular mobilization techniques in patients with primary adhesive capsulitis (AC) of the shoulder.

DATA SOURCES:

PubMed and Web of Science were searched for relevant studies published before November 2014. Additional references were identified by manual screening of the reference lists.

STUDY SELECTION:

All English language RCTs evaluating the efficacy of mobilization techniques on range of motion (ROM) and pain in adult patients with primary AC of the shoulder were included in this systematic review. Twelve RCTs involving 810 patients were included.

DATA EXTRACTION:

Two reviewers independently screened the articles, scored methodological quality and extracted data for analysis. The review was conducted and reported according to the PRISMA Statement. All studies were assessed in duplicate for risk of bias using the Physiotherapy Evidence Database scale for randomized controlled trials.

DATA SYNTHESIS:

The efficacy of 7 different types of mobilization techniques was evaluated. Angular mobilization (N=2), CYRIAX approach (N=1) and Maitland's technique (N=6) showed improvement in pain score and ROM. With respect to translational mobilizations (N=1), posterior glides are preferred to restore external rotation. Spine mobilizations combined with glenohumeral stretching and both angular and translational mobilization (N=1) had a superior effect on active ROM compared to sham ultrasound. High intensity mobilization (N=1) showed less improvement in Constant Murley Score compared to a neglect group. Finally, positive long-term effects of Mulligan's technique (N=1) were found on both pain and ROM.

CONCLUSION:

Overall, mobilization techniques have beneficial effects in patients with primary AC of the shoulder. Due to preliminary evidence for many mobilization techniques, the Maitland's technique and the combined mobilizations seem recommended at the moment.

KEYWORDS: Adhesive capsulitis; efficacy; frozen shoulder; mobilization; systematic review
PMID: 26284892

46 A. UPPER LIMB NEUROMOBILIZATION

Double crush

J Am Acad Orthop Surg. 2015 Sep;23(9):558-62. doi: 10.5435/JAAOS-D-14-00176.

Double Crush Syndrome.

Kane PM, Daniels AH, Akelman E.

Abstract

Double crush syndrome is a distinct compression at two or more locations along the course of a peripheral nerve that can coexist and synergistically increase symptom intensity. In addition, dissatisfaction after treatment at one site may be the result of persistent pathology at another site along a peripheral nerve. Double crush syndrome is a controversial diagnosis; some scientists and surgeons believe it is an illness construction that may do more harm than good because it emphasizes an objective pathophysiologic explanation for unexplained symptoms, disability, and dissatisfaction that may be more psychosocially mediated. However, peripheral neuropathy may coexist with compressive neuropathy and contribute to suboptimal outcomes following nerve decompression. To better manage patients' expectations, treating practitioners should be aware of the possibility of concomitant cervical radiculopathy and carpal tunnel syndrome, as well as the presence of underlying systemic neuropathy.

KEYWORDS: double crush; neuropathy

PMID: 26306807

48 A. STM**Myofascial release for the pelvic floor**

Female Pelvic Med Reconstr Surg. 2015 Sep-Oct;21(5):252-6. doi: 10.1097/SPV.0000000000000195.

Pelvic Floor Physical Therapy as Primary Treatment of Pelvic Floor Disorders With Urinary Urgency and Frequency-Predominant Symptoms.

Adams SR¹, Dessie SG, Dodge LE, Mckinney JL, Hacker MR, Elkadry EA.
Author information

Abstract

OBJECTIVE:

To assess the efficacy of pelvic floor physical therapy (PFPT) as primary treatment of urinary urgency and frequency symptoms

METHODS:

We conducted a prospective cohort study of women with urinary urgency and frequency symptoms. Participants underwent PFPT once or twice per week for 10 weeks. Symptom improvement was assessed by validated questionnaires (Pelvic Floor Distress Inventory-Short Form 20 and Patient Global Impression of Improvement), voiding diaries, and subjective measures.

RESULTS:

Fifty-seven participants enrolled; 21 (36.8%) withdrew or completed less than 5 weeks of PFPT. Thirty-one (54.4%) of the remaining 36 participants completed 10 weeks of PFPT. The mean age of the study group (n = 36) was 48.9 ± 15.0 years. The primary diagnoses were overactive bladder syndrome (n = 24, 66.7%) and painful bladder syndrome (n = 12, 33.3%). Women attended a median of 14.0 (interquartile range [IQR], 8.0-16.0) PFPT visits over a median of 11.9 weeks (IQR, 10.0-18.1). At baseline, the median Pelvic Floor Distress Inventory-Short Form 20 score was 79.2 (IQR, 53.1-122.9), and decreased to 50.0 (IQR, 25.0-88.5; P < 0.001) after PFPT; the urinary and prolapse symptom subscales both decreased significantly. Participants reported a decrease from a median of 10.0 voids per day to 8.0 (P < 0.001). On the Patient Global Impression of Improvement, 62.5% of women reported that they were "much better" or "very much better."

CONCLUSIONS:

The PFPT with myofascial release techniques improves urinary symptoms while avoiding medications and more invasive therapies. The high dropout rates suggest that motivation or logistic factors may play a significant role in the utilization and success of this treatment option.

PMID: 26313494

STM for extremities

The effectiveness of soft-tissue therapy for the management of musculoskeletal disorders and injuries of the upper and lower extremities: A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration

Steven Piper

, Heather M. Shearer Pierre Côté Gabrielle van der Velde Anne Taylor-Vaisey

DOI: <http://dx.doi.org/10.1016/j.math.2015.08.011>

Highlights

- Movement re-education is effective for treating persistent lateral epicondylitis
- Myofascial release therapy is effective for managing lateral epicondylitis
- Plantar fasciitis can be managed effectively with myofascial release therapy
- Localized relaxation massage combined with multimodal care may be helpful for carpal tunnel syndrome

Abstract

Background

Soft-tissue therapy is commonly used to manage musculoskeletal injuries.

Objective

To determine the effectiveness of soft-tissue therapy for the management of musculoskeletal disorders and injuries of the upper and lower extremities.

Design

Systematic Review

Methods

We searched six databases from 1990 to 2015 and critically appraised eligible articles using Scottish Intercollegiate Guidelines Network (SIGN) criteria. Evidence from studies with low risk of bias was synthesized using best-evidence synthesis methodology.

Results

We screened 9,869 articles and critically appraised seven; six had low risk of bias. Localized relaxation massage provides added benefits to multimodal care immediately post-intervention for carpal tunnel syndrome. Movement re-education (contraction/passive stretching) provides better long-term benefit than one corticosteroid injection for lateral epicondylitis. Myofascial release improves outcomes compared to sham ultrasound for lateral epicondylitis. Diacutaneous fibrolysis (DF) or sham DF leads to similar outcomes in pain intensity for subacromial impingement syndrome. Trigger point therapy may provide limited or no additional benefit when combined with self-stretching for plantar fasciitis; however, myofascial release to the gastrocnemius, soleus and plantar fascia is effective.

Conclusion

Our review clarifies the role of soft-tissue therapy for the management of upper and lower extremity musculoskeletal disorders and injuries. Myofascial release therapy was effective for treating lateral epicondylitis and plantar fasciitis. Movement re-education was also effective for managing lateral epicondylitis. Localized relaxation massage combined with multimodal care may provide short-term benefit for treating carpal tunnel syndrome. More high quality research is needed to study the appropriateness and comparative effectiveness of this widely utilized form of treatment.

Keywords:

musculoskeletal injuries, soft-tissue therapy, massage, systematic review

Massage and LBP

Cochrane Database Syst Rev. 2015 Sep 1;9:CD001929.

Massage for low-back pain.

Furlan AD¹, Giraldo M, Baskwill A, Irvin E, Imamura M.

Author information

Abstract

BACKGROUND: Low-back pain (LBP) is one of the most common and costly musculoskeletal problems in modern society. It is experienced by 70% to 80% of adults at some time in their lives. Massage therapy has the potential to minimize pain and speed return to normal function.

OBJECTIVES: To assess the effects of massage therapy for people with non-specific LBP.

SEARCH METHODS: We searched PubMed to August 2014, and the following databases to July 2014: MEDLINE, EMBASE, CENTRAL, CINAHL, LILACS, Index to Chiropractic Literature, and Proquest Dissertation Abstracts. We also checked reference lists. There were no language restrictions used.

SELECTION CRITERIA: We included only randomized controlled trials of adults with non-specific LBP classified as acute, sub-acute or chronic. Massage was defined as soft-tissue manipulation using the hands or a mechanical device. We grouped the comparison groups into two types: inactive controls (sham therapy, waiting list, or no treatment), and active controls (manipulation, mobilization, TENS, acupuncture, traction, relaxation, physical therapy, exercises or self-care education).

DATA COLLECTION AND ANALYSIS: We used standard Cochrane methodological procedures and followed CBN guidelines. Two independent authors performed article selection, data extraction and critical appraisal.

MAIN RESULTS: In total we included 25 trials (3096 participants) in this review update. The majority was funded by not-for-profit organizations. One trial included participants with acute LBP, and the remaining trials included people with sub-acute or chronic LBP (CLBP). In three trials massage was done with a mechanical device, and the remaining trials used only the hands. The most common type of bias in these studies was performance and measurement bias because it is difficult to blind participants, massage therapists and the measuring outcomes. We judged the quality of the evidence to be "low" to "very low", and the main reasons for downgrading the evidence were risk of bias and imprecision. There was no suggestion of publication bias. For acute LBP, massage was found to be better than inactive controls for pain ((SMD -1.24, 95% CI -1.85 to -0.64; participants = 51; studies = 1)) in the short-term, but not for function ((SMD -0.50, 95% CI -1.06 to 0.06; participants = 51; studies = 1)). For sub-acute and chronic LBP, massage was better than inactive controls for pain ((SMD -0.75, 95% CI -0.90 to -0.60; participants = 761; studies = 7)) and function (SMD -0.72, 95% CI -1.05 to -0.39; 725 participants; 6 studies;) in the short-term, but not in the long-term; however, when compared to active controls, massage was better for pain, both in the short ((SMD -0.37, 95% CI -0.62 to -0.13; participants = 964; studies = 12)) and long-term follow-up ((SMD -0.40, 95% CI -0.80 to -0.01; participants = 757; studies = 5)), but no differences were found for function (both in the short and long-term). There were no reports of serious adverse events in any of these trials. Increased pain intensity was the most common adverse event reported in 1.5% to 25% of the participants.

AUTHORS' CONCLUSIONS: We have very little confidence that massage is an effective treatment for LBP. Acute, sub-acute and chronic LBP had improvements in pain outcomes with massage only in the short-term follow-up. Functional improvement was observed in participants with sub-acute and chronic LBP when compared with inactive controls, but only for the short-term follow-up. There were only minor adverse effects with massage.

48 C. MUSCLES**Hamstrings/exercise and tears**

J Sport Rehabil. 2015 Sep 9. [Epub ahead of print]

Rehabilitation After Hamstring Strain Injury Emphasizing Eccentric Strengthening at Long Muscle Lengths: Results of Long Term Follow-up.

Tyler TF¹, Schmitt BM, Nicholas SJ, McHugh M.

[Author information](#)

[Abstract](#)

CONTEXT:

Hamstring strain injuries have a high recurrence rate.

OBJECTIVE:

To determine if a protocol emphasizing eccentric strength training with the hamstrings in a lengthened position resulted in a low recurrence rate.

DESIGN:

Longitudinal cohort study Setting: Sports medicine physical therapy clinic.

PARTICIPANTS:

50 athletes with hamstring strain injury (age 36±16 yo; 30 men, 20 women; 3 G1, 43 G2, 4 G3; 25 recurrent injuries) followed a 3-phase rehabilitation protocol emphasizing eccentric strengthening with the hamstrings in a lengthened position.

MAIN OUTCOME MEASURES:

Injury recurrence; isometric hamstring strength at 80°, 60°, 40° and 20° knee flexion in sitting with the thigh flexed to 40° above the horizontal and the seat back at 90° to the horizontal (strength tested prior to return to sport).

RESULTS:

Four of the fifty athletes sustained reinjuries between 3 and 12 months after return to sport (8% recurrence rate). The other 42 athletes had not sustained a reinjury at an average of 24±12 mo after return to sport. Eight noncompliant athletes did not complete the rehabilitation and returned to sport prior to initiating eccentric strengthening in the lengthened state. All four reinjuries occurred in these noncompliant athletes. At time of return to sport, compliant athletes had full restoration of strength while noncompliant athletes had significant hamstring weakness, which was progressively worse at longer muscle lengths (Compliance x Side x Angle P=0.006; involved vs. noninvolved at 20°, compliant 7% stronger, noncompliant 43% weaker).

CONCLUSION:

Compliance with rehabilitation emphasizing eccentric strengthening with the hamstrings in a lengthened position resulted in no reinjuries.

PMID: 26356045

53. CORE

Types of core

Disabil Rehabil. 2015 Sep 2:1-9.

A comparison of water-based and land-based core stability exercises in patients with lumbar disc herniation: a pilot study.

Bayraktar D¹, Guclu-Gunduz A, Lambeck J, Yazici G, Aykol S, Demirci H.
Author information

Abstract

PURPOSE:

To determine and compare the effects of core stability exercise programs performed in two different environments in lumbar disc herniation (LDH) patients.

METHOD:

Thirty-one patients who were diagnosed with LDH and were experiencing pain or functional disability for at least 3 months were randomly divided into two groups as land-based exercises or water specific therapy. Also, 15 age-sex-matched healthy individuals were recruited as healthy controls. Both groups underwent an 8-week (3 times/week) core stabilization exercise program. Primary outcomes were pain, trunk muscle static endurance and perceived disability level. The secondary outcome was health-related quality of life.

RESULTS:

Level of static endurance of trunk muscles was found to be lower in the patients compared to the controls at baseline ($p < 0.05$). Both treatment groups showed significant improvements in all outcomes ($p < 0.05$) after 8-week intervention. When two treatment groups were compared, no differences were found in the amount of change after the intervention ($p > 0.05$). After the treatment, static endurance of trunk muscles of the LDH patients became similar to controls ($p > 0.05$).

CONCLUSION:

According to these results, core stabilization exercise training performed on land or in water both could be beneficial in LDH patients and there is no difference between the environments. Implications for Rehabilitation An 8-week core stabilization program performed in water or on land decrease pain level and improve functional status in LDH patients. Both programs seem beneficial to increase health-related quality of life and static endurance of trunk muscles. Core stability exercises could be performed in water as well, no differences were found between methods due to environment.

KEYWORDS: Lower back pain; stability exercises; water-based therapy

PMID: 26328542

56. ATHLETICS

Uneven surfaces and training

Sports Med. 2015 Sep 10.

Effects of Strength Training Using Unstable Surfaces on Strength, Power and Balance Performance Across the Lifespan: A Systematic Review and Meta-analysis.

Behm DG¹, Muehlbauer T², Kibele A³, Granacher U⁴.

Author information

Abstract

BACKGROUND: The effectiveness of strength training on unstable surfaces (STU) versus stable surfaces (STS) or a control condition (CON; i.e. no training or regular training only) for strength, power and balance performance across the lifespan has not yet been investigated in a systematic review and meta-analysis.

OBJECTIVE: The aims of this systematic review and meta-analysis were to determine the general effects of STU versus STS or CON on muscle strength, power and balance in healthy individuals across the lifespan and to investigate whether performance changes following STU are age specific.

DATA SOURCES: A computerized systematic literature search was performed in the electronic databases PubMed and Web of Science from January 1984 up to February 2015.

STUDY ELIGIBILITY CRITERIA: Initially, 209 articles were identified for review. Only controlled trials were included if they investigated STU in healthy individuals and tested at least one measure of maximal strength, strength endurance, muscle power, or static/dynamic balance. In total, 22 studies met the inclusion criteria.

STUDY APPRAISAL AND SYNTHESIS METHODS: The included studies were coded for the following criteria: age, sex, training status, training modality, exercise and test modality. Effect size measures included within-subject standardized mean differences (SMD_w) and weighted between-subject standardized mean differences (SMD_b). Heterogeneity between studies was assessed using I^2 and χ^2 statistics. The methodological quality of each study was assessed using the Physiotherapy Evidence Database (PEDro) Scale.

RESULTS: Our search failed to identify studies that examined the effects of STU versus STS or CON in children and middle-aged adults. However, four studies were identified that investigated the effects of STU versus CON or STS in adolescents, 15 studies were identified in young adults and three studies were identified in old adults. Compared with CON, STU produced medium effects on maximal strength in young adults and no effects to medium effects in old adults. In addition, large effects were detected on strength endurance in adolescents and in young adults; in old adults, a small effect was found. With regard to muscle power, medium effects were observed in young adults and small effects were observed in old adults. Further, large effects were found for static and dynamic balance in old adults, but only a small effect was found for dynamic balance in young adults. The comparison of STU and STS revealed inconsistent results as indicated by training-induced changes in favour of STU, as well as STS. Small to medium effects were found for maximal strength in adolescents in favour of STS, and small effects were found in young adults in favour of STU. With regard to strength endurance, large effects were found in adolescents in favour of STS and small effects were found in favour of STU. Additionally, we detected small effects in young adults in favour of STU. In terms of muscle power, no effects were observed in adolescents but medium effects were found in favour of STS in young adults. With regard to balance, small effects were detected in adolescents for static and dynamic balance

in favour of STU. In young adults, small effects were found for static balance in favour of STS. With regard to dynamic balance, the analysis revealed small effects in young adults in favour of STU.

LIMITATIONS: The quality of the included studies was rather low, with mean PEDro scores of 5.8, 4.0 and 5.0 for studies including adolescents, young adults and old adults, respectively. Further, trivial to considerable heterogeneity between studies (i.e. $0\% \leq I^2 \leq 96\%$) was detected.

CONCLUSIONS: Compared with CON, STU is effective in improving muscle strength, power and balance in adolescents, young adults and old adults. However, inconsistent results were particularly found in adolescents and young adults when the specific effects of STU were compared with those of STS. We conclude that the performance of STU compared with STS has limited extra effects on muscle strength, power and balance performance in healthy adolescents and young adults. Given that our systematic search did not identify studies that examined the effects of STU versus STS in children, middle-aged adults and old adults, further research of high methodological quality is needed to determine whether there are additive effects of STU as compared with STS in those age groups.

57. GAIT**Hip dysplasia and gait adaptations**

Gait Posture. 2015 Aug 29. pii: S0966-6362(15)00814-0. doi: 10.1016/j.gaitpost.2015.08.008.

Walking patterns and hip contact forces in patients with hip dysplasia.

Skalshøi O¹, Iversen CH², Nielsen DB³, Jacobsen J⁴, Mechlenburg I⁵, Søballe K⁶, Sørensen H⁷.
Author information

Abstract

INTRODUCTION:

Several studies have investigated walking characteristics in hip dysplasia patients, but so far none have described all hip rotational degrees of freedom during the whole gait cycle. This descriptive study reports 3D joint angles and torques, and furthermore extends previous studies with muscle and joint contact forces in 32 hip dysplasia patients and 32 matching controls.

METHODS:

3D motion capture data from walking and standing trials were analysed. Hip, knee, ankle and pelvis angles were calculated with inverse kinematics for both standing and walking trials. Hip, knee and ankle torques were calculated with inverse dynamics, while hip muscle and joint contact forces were calculated with static optimisation for the walking trials.

RESULTS:

No differences were found between the two groups while standing. While walking, patients showed decreased hip extension, increased ankle pronation and increased hip abduction and external rotation torques. Furthermore, hip muscle forces were generally lower and shifted to more posteriorly situated muscles, while the hip joint contact force was lower and directed more superiorly.

CONCLUSION:

During walking, patients showed lower and more superiorly directed hip joint contact force, which might alleviate pain from an antero-superiorly degenerated joint.

KEYWORDS: Gait analysis; Hip dysplasia; Joint contact force; Muscle force; OpenSim

PMID: 26365370

Hip abductor fatigue and gait

Effects of hip abductor muscle fatigue on gait control and hip position sense in healthy older adults

Gait and Posture, 09/11/2015 Arvin M, et al.

In this study, the authors experimentally investigated whether unilateral hip abductor muscle fatigue affected gait control and hip position sense in older adults. Negative effects of fatigue on gait variability, step-to-step symmetry, mediolateral trunk velocity control and hip position sense indicate the importance of hip abductor muscles for gait control.

LBP changes in gait**Lumbar spine kinematics during walking in people with and people without low back pain**

Gait and Posture, 09/17/2015 Gombatto SP, et al.

Low back pain (LBP) is a problem that can contribute to functional limitations and disability. Understanding kinematics during walking can provide a basis for examination and treatment in people with LBP. Walking was provocative of LBP in few subjects, and differences between people with and without LBP and among LBP subgroups were minimal. Limitations include that attempts to standardize gait speed may have minimized observed effects, and there was limited power to detect movement-based LBP subgroup differences.

Methods

- A clinical examination then was conducted to assign people with LBP to a movement-based subgroup and differences in kinematics among subgroups were examined.
- All subjects displayed significantly more upper than lower lumbar movement in the axial and coronal planes ($P < .01$).
- People with LBP displayed significantly less overall lumbar rotation than controls ($P < .05$).

Results

- There were no significant group differences in sagittal plane kinematics ($P > .05$).
- Walking was limited by or provocative of pain in $<25\%$ of subjects with LBP.
- There were predictable differences in kinematics among some movement-based LBP subgroups that approached statistical significance ($P = .09-.11$).

58. RUNNING**Major economic impact of injuries while training**

Scand J Med Sci Sports. 2015 Aug 17. doi: 10.1111/sms.12541.

Health and economic burden of running-related injuries in runners training for an event: A prospective cohort study.

Hespanhol Junior LC¹, van Mechelen W^{1,2,3,4}, Postuma E⁵, Verhagen E^{1,3,6}.
Author information

Abstract

Prospective running-related injury (RRI) data from runners training for an event are scarce, especially with regard to RRI-associated costs. Therefore, the aim of this study was to investigate the prevalence and economic burden of RRIs in runners participating in an organized training program preparing them for an event. This was a prospective cohort study with 18 weeks of follow-up. Individuals aged 18 or older and registered to participate in an organized running program were eligible. Follow-up surveys were sent every 2 weeks to collect data about running exposure, RRIs, and costs. Of the 161 potential participants, 53 (32.9%) were included in this study. A total of 32 participants reported 41 RRIs. The mean prevalence during follow-up was 30.8% [95% confidence interval (CI) 25.6-36.0%]. Overuse was the main mechanism of RRI (85.4%, n = 35). An RRI was estimated to have an economic burden of €57.97 (95% CI €26.17-94.00) due to healthcare utilization (direct costs) and €115.75 (95% CI €10.37-253.73) due to absenteeism from paid work (indirect costs). These results indicate that the health and economic burden of RRIs may be considered significant for public health. Therefore, prevention programs are needed for runners participating in organized training programs.

KEYWORDS: Sports injury; costs and cost analysis; epidemiological monitoring; epidemiology; public health surveillance

PMID: 26282068

Foot strike patterns

J Orthop Sports Phys Ther. 2015 Aug 24:1-40.

Biomechanical Differences of Foot Strike Patterns During Running: A Systematic Review With Meta-Analysis.

Almeida MO¹, Davis IS, Lopes AD.
Author information

Abstract

Study Design Systematic review with meta-analysis. **Objective** To determine the biomechanical differences between foot strike patterns using when running. **Background** Strike patterns during running has received attention in the recent literature due to the mechanical differences and associated injury risks between them. **Methods** Electronic databases (Medline, Embase, Lilacs, Scielo, and SPORTDiscus) were searched through July 2014. Studies (cross-sectional, case control, prospective, and retrospective) comparing biomechanical characteristics between foot strike patterns during running of distance runners with at least 18 years of age were included in this review. Two independent reviewers evaluated the risk of bias. A meta-analysis with a random-effects model was used to combine the data from the included studies. **Results** Sixteen studies were included in the final analysis. In the meta-analyses of kinematic variables, significant differences between forefoot and rearfoot strikers were found for foot and knee angle at initial contact and knee flexion range of motion. A forefoot strike pattern resulted in a plantar flexed ankle position and a more flexed knee position, compared to a dorsiflexed ankle position and a more extended knee position for the rearfoot strikers, at initial contact with ground. In the comparison of rearfoot and midfoot strikers, midfoot strikers demonstrated greater ankle dorsiflexion range of motion and decreased knee flexion range of motion compared to rearfoot strikers. For kinetic variables, the meta-analysis revealed that rearfoot strikers had higher vertical loading rates compared to forefoot strikers.

Conclusion There are differences in kinematic and kinetic characteristics between foot strike patterns when running. Clinicians should be aware of these characteristics to help in the management of running injuries and advice on training. J Orthop Sports Phys Ther, Epub 24 Aug 2015. doi:10.2519/jospt.2015.6019.

KEYWORDS: biomechanics; jogging; landing; runners

PMID:26304644

Longer stride length more injuries

Am J Sports Med. 2015 Sep;43(9):2310-7. doi: 10.1177/0363546515592837. Epub 2015 Aug 4.

Select Injury-Related Variables Are Affected by Stride Length and Foot Strike Style During Running.

Boyer ER¹, Derrick TR².
Author information

Abstract

BACKGROUND:

Some frontal plane and transverse plane variables have been associated with running injury, but it is not known if they differ with foot strike style or as stride length is shortened.

PURPOSE:

To identify if step width, iliotibial band strain and strain rate, positive and negative free moment, pelvic drop, hip adduction, knee internal rotation, and rearfoot eversion differ between habitual rearfoot and habitual mid-/forefoot strikers when running with both a rearfoot strike (RFS) and a mid-/forefoot strike (FFS) at 3 stride lengths.

STUDY DESIGN:

Controlled laboratory study.

METHODS:

A total of 42 healthy runners (21 habitual rearfoot, 21 habitual mid-/forefoot) ran overground at 3.35 m/s with both a RFS and a FFS at their preferred stride lengths and 5% and 10% shorter.

RESULTS:

Variables did not differ between habitual groups. Step width was 1.5 cm narrower for FFS, widening to 0.8 cm as stride length shortened. Iliotibial band strain and strain rate did not differ between foot strikes but decreased as stride length shortened (0.3% and 1.8%/s, respectively). Pelvic drop was reduced 0.7° for FFS compared with RFS, and both pelvic drop and hip adduction decreased as stride length shortened (0.8° and 1.5°, respectively). Peak knee internal rotation was not affected by foot strike or stride length. Peak rearfoot eversion was not different between foot strikes but decreased 0.6° as stride length shortened. Peak positive free moment (normalized to body weight [BW] and height [h]) was not affected by foot strike or stride length. Peak negative free moment was -0.0038 BW·m/h greater for FFS and decreased -0.0004 BW·m/h as stride length shortened.

CONCLUSION:

The small decreases in most variables as stride length shortened were likely associated with the concomitant wider step width. RFS had slightly greater pelvic drop, while FFS had slightly narrower step width and greater negative free moment.

CLINICAL RELEVANCE:

Shortening one's stride length may decrease or at least not increase propensity for running injuries based on the variables that we measured. One foot strike style does not appear universally better than the other; rather, different foot strike styles may predispose runners to different types of injuries.

KEYWORDS: forefoot strike; free moment; iliotibial band; pelvic drop; rearfoot strike; step width

PMID:26243741

59. PAIN**Cognitive behavioral pain management and sleep**

Pain Med. 2015 Sep 9. doi: 10.1111/pme.12903.

The Impact of a Cognitive Behavioral Pain Management Program on Sleep in Patients with Chronic Pain: Results of a Pilot Study.

Blake C¹, Cunningham J¹, Power CK², Horan S², Spencer O², Fullen BM¹.

Author information

Abstract

OBJECTIVE:

To determine the impact of a cognitive behavioral pain management program on sleep in patients with chronic pain.

DESIGN:

Prospective nonrandomized controlled pilot study with evaluations at baseline and 12 weeks
SETTING: Out-patient multidisciplinary cognitive behavioral pain management program in a university teaching hospital
SUBJECTS: Patients with chronic pain who fulfilled the criteria for participation in a cognitive behavioral pain management program.

METHODS:

Patients assigned to the intervention group (n = 24) completed a 4 week cognitive behavioral pain management program, and were compared with a waiting list control group (n = 22). Assessments for both groups occurred at baseline and two months post cognitive behavioral pain management program. Outcome measures included self-report (Pittsburgh Sleep Quality Index) and objective (actigraphy) sleep measures, pain and quality of life measures.

RESULTS:

Both groups were comparable at baseline, and all had sleep disturbance. The Pittsburgh Sleep Quality Index correlated with only two of the seven objective sleep measures (fragmentation index $r = 0.34$, $P = 0.02$, and sleep efficiency percentage $r = -0.31$, $P = 0.04$). There was a large treatment effect for cognitive behavioral pain management program group in mean number of wake bouts ($d = 0.76$), where a significant group*time interaction was also found ($P = 0.016$), showing that the CBT-PMP group improved significantly more than controls in this sleep variable
CONCLUSIONS: Patients attending a cognitive behavioral pain management program have high prevalence of sleep disturbance, and actigraphy technology was well tolerated by the patients. Preliminary analysis of the impact of a cognitive behavioral pain management program on sleep is promising, and warrants further investigation.

KEYWORDS: Cognitive Behavioral Therapy; Pain Management Program; Sleep
PMID: 26352702

61. FIBROMYALGIA**Autonomic impact**

Psychosom Med. 2015 Sep;77(7):721-32. doi: 10.1097/PSY.0000000000000217.

Affective Modulation of Brain and Autonomic Responses in Patients With Fibromyalgia.

Rosselló F¹, Muñoz MA, Duschek S, Montoya P.

Author information

Abstract

OBJECTIVES:

Emotional dysregulation and abnormal processing of affective information are thought to play a significant role for the maintenance of pain in fibromyalgia. The motivational priming hypothesis states that negative emotions could increase pain via activation of the aversive system, thus leading to an affective modulation of defensive reflexes. Nevertheless, little is known about peripheral and central correlates of affective reflex modulation in fibromyalgia.

METHODS:

Thirty patients with fibromyalgia and 30 healthy individuals were asked to view three video clips from a self-perspective to induce specific mood states. Video clips consisted of the same virtual walk through different locations of a park under three affective environments (unpleasant, pleasant, and neutral). Startle eyeblink reflex and heart rate response elicited by abrupt startle noises, as well as heart rate variability and electroencephalography (EEG) oscillations were recorded when participants were passively viewing the virtual environments.

RESULTS:

Patients with fibromyalgia rated all environments as more negative and arousing than did healthy controls (p values < .05). Nevertheless, startle eyeblink reflex and heart rate response were lower in patients with fibromyalgia than in healthy controls when viewing all three environments (p values < .05). Patients with fibromyalgia also displayed lower heart rate variability, as well as higher EEG power (2-22 Hz) during all environments than did healthy controls (p values < .05).

CONCLUSIONS:

Patients with fibromyalgia were characterized by relevant deficits in affective modulation of startle and cardiac responses, heart rate variability, and EEG power spectra in response to sustained induction of affective states. These findings suggest an alteration of emotional and attentional aspects of information processing at subjective, autonomic, and central nervous system levels.

PMID: 26186433

62 A. NUTRITION/VITAMINS**Salt and BP**

J Am Heart Assoc. 2015 Jul 29;4(8). pii: e001959. doi: 10.1161/JAHA.115.001959.

Dietary Sodium Consumption Predicts Future Blood Pressure and Incident Hypertension in the Japanese Normotensive General Population.

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Author information

Abstract

BACKGROUND:

Although there is a close relationship between dietary sodium and hypertension, the concept that persons with relatively high dietary sodium are at increased risk of developing hypertension compared with those with relatively low dietary sodium has not been studied intensively in a cohort.

METHODS AND RESULTS:

We conducted an observational study to investigate whether dietary sodium intake predicts future blood pressure and the onset of hypertension in the general population. Individual sodium intake was estimated by calculating 24-hour urinary sodium excretion from spot urine in 4523 normotensive participants who visited our hospital for a health checkup. After a baseline examination, they were followed for a median of 1143 days, with the end point being development of hypertension. During the follow-up period, hypertension developed in 1027 participants (22.7%). The risk of developing hypertension was higher in those with higher rather than lower sodium intake (hazard ratio 1.25, 95% CI 1.04 to 1.50). In multivariate Cox proportional hazards regression analysis, baseline sodium intake and the yearly change in sodium intake during the follow-up period (as continuous variables) correlated with the incidence of hypertension. Furthermore, both the yearly increase in sodium intake and baseline sodium intake showed significant correlations with the yearly increase in systolic blood pressure in multivariate regression analysis after adjustment for possible risk factors.

CONCLUSIONS:

Both relatively high levels of dietary sodium intake and gradual increases in dietary sodium are associated with future increases in blood pressure and the incidence of hypertension in the Japanese general population.

KEYWORDS: blood pressure; diet; hypertension; lifestyle; prediction; salt

Folate/B12 improves reproductive odds

Am J Clin Nutr. 2015 Sep 9. pii: ajcn112185.

Association between serum folate and vitamin B-12 and outcomes of assisted reproductive technologies.

Gaskins AJ¹, Chiu YH², Williams PL³, Ford JB⁴, Toth TL⁵, Hauser R⁶, Chavarro JE⁷; EARTH Study Team.

Author information

Abstract

BACKGROUND:

Preconceptional folate and vitamin B-12 have been linked to beneficial reproductive outcomes in both natural pregnancies and those after assisted reproductive technology (ART) treatment.

OBJECTIVE:

The objective of the study was to evaluate the associations of serum folate and vitamin B-12 with ART outcomes.

DESIGN:

This analysis included a random sample of 100 women (154 ART cycles) participating in a prospective cohort study [Environment and Reproductive Health (EARTH)] at the Massachusetts General Hospital Fertility Center (2007-2013). Serum folate and vitamin B-12 were measured in blood samples collected between days 3 and 9 of treatment. Generalized estimating equations with adjustment for age, BMI, and race were used to evaluate the association of serum folate and vitamin B-12 with ART outcomes.

RESULTS:

Women in the highest quartile of serum folate (>26.3 ng/mL) had 1.62 (95% CI: 0.99, 2.65) times the probability of live birth compared with women in the lowest quartile (<16.6 ng/mL). Women in the highest quartile of serum vitamin B-12 (>701 pg/mL) had 2.04 (95% CI: 1.14, 3.62) times the probability of live birth compared with women in the lowest quartile (<439 pg/mL). Suggestive evidence of an interaction was observed; women with serum folate and vitamin B-12 concentrations greater than the median had 1.92 (95% CI: 1.12, 3.29) times the probability of live birth compared with women with folate and vitamin B-12 concentrations less than or equal to the median. This translated into an adjusted difference in live birth rates of 26% (95% CI: 10%, 48%; P = 0.02).

CONCLUSION:

Higher serum concentrations of folate and vitamin B-12 before ART treatment were associated with higher live birth rates among a population exposed to folic acid fortification. This trial was registered at clinicaltrials.gov as NCT00011713.

KEYWORDS: assisted reproduction; folate; in vitro fertilization; infertility; pregnancy; vitamin B-12

PMID:26354529

Folic acid and birth defects

Report: Folic acid fortification in Europe could halve rates of birth defects and infant mortality

Emory's Woodruff Health Sciences Center News, 09/14/2015

A recent report co-authored by epidemiologists at the Rollins School of Public Health at Emory University and scientists in Europe has documented a highly preventable epidemic of two major birth defects – spina bifida and anencephaly – in Europe. The authors report the epidemic is caused by the failure of European governments to require mandatory folic acid fortification. Mandatory folic acid fortification of staple foods like wheat or other grain flours is a proven, safe and cost-effective public health intervention that has been preventing spina bifida and anencephaly in the United States and Canada for the last 15 years. According to the report, about 5,000 European children have had preventable life altering, paralyzing, and often fatal birth defects due to the government's failure to require mandatory folic acid fortification. Incorporating this intervention to reach all women of childbearing potential, without any behavior modification can reduce the number of birth defects by nearly half. Complete findings of this study titled "Preventable spina bifida and anencephaly in Europe" are available in an online edition of Birth Defects Research Part A – Clinical and Molecular Teratology.

Beef/milk and exercise

Am J Clin Nutr. 2015 Sep 9. pii: ajcn103184.

Differences in postprandial protein handling after beef vs. milk ingestion during postexercise recovery: a randomized controlled trial.

Burd NA¹, Gorissen SH¹, van Vliet S¹, Snijders T¹, van Loon LJ².

Author information

Abstract

BACKGROUND:

Protein consumed after resistance exercise increases postexercise muscle protein synthesis rates. To date, dairy protein has been studied extensively, with little known about the capacity of other protein-dense foods to augment postexercise muscle protein synthesis rates.

OBJECTIVE:

We aimed to compare protein digestion and absorption kinetics, postprandial amino acid availability, anabolic signaling, and the subsequent myofibrillar protein synthetic response after the ingestion of milk vs. beef during recovery from resistance-type exercise.

DESIGN:

In crossover trials, 12 healthy young men performed a single bout of resistance exercise. Immediately after cessation of exercise, participants ingested 30 g protein by consuming isonitrogenous amounts of intrinsically L-[1-¹³C]phenylalanine-labeled beef or milk. Blood and muscle biopsy samples were collected at rest and after exercise during primed continuous infusions of L-[ring-²H₅]phenylalanine and L-[ring-3,5-²H₂]tyrosine to assess protein digestion and absorption kinetics, plasma amino acid availability, anabolic signaling, and subsequent myofibrillar protein synthesis rates in vivo in young men.

RESULTS:

Beef protein-derived phenylalanine appeared more rapidly in circulation compared with milk ingestion ($P < 0.001$). The availability of phenylalanine during the 5-h postexercise period tended to be higher after beef ($64\% \pm 3\%$) compared with milk ingestion ($57\% \pm 3\%$; $P = 0.08$). Both beef and milk ingestion were followed by an increase in the phosphorylation of mammalian target of rapamycin complex 1 and 70 kDa S6 protein kinase 1 during postexercise recovery. Milk ingestion increased myofibrillar protein synthesis rates to a greater extent than did beef ingestion during the 0- to 2-h postexercise phase ($P = 0.013$). However, the increase in myofibrillar protein synthesis rates did not differ between milk and beef ingestion during the entire 0- to 5-h postexercise phase ($P = 0.114$).

CONCLUSIONS:

Both milk and beef ingestion augment the postexercise myofibrillar protein synthetic response in young men with a stronger stimulation of myofibrillar protein synthesis during the early postprandial stage after milk ingestion. This trial was registered at www.clinicaltrials.gov as NCT01578590.

KEYWORDS: hypertrophy; leucine; muscle mass; sports nutrition; weightlifting

PMID: 26354539

Vit D and breast cancer

Am J Clin Nutr. 2015 Sep 9. pii: ajcn104323.

Interaction between current vitamin D supplementation and menopausal hormone therapy use on breast cancer risk: evidence from the E3N cohort.

Cadeau C¹, Fournier A¹, Mesrine S¹, Clavel-Chapelon F¹, Fagherazzi G¹, Boutron-Ruault MC².
Author information

Abstract

BACKGROUND:

Experimental studies suggest protective effects of vitamin D on breast carcinogenesis, particularly on estrogen receptor-positive tumors. Epidemiologic data are less conclusive.

OBJECTIVE:

Our objective was to investigate the association between postmenopausal breast cancer risk and current or past vitamin D supplementation overall and according to the use of menopausal hormone therapy (MHT).

DESIGN:

Between 1995 and 2008, 2482 invasive breast cancer cases were diagnosed among 57,403 postmenopausal women from the E3N prospective cohort during 581,085 person-years. Vitamin D supplementation was assessed from biennially self-administered questionnaires sent in 1995, 2000, 2002, and 2005 and from medico-administrative data on drug reimbursements since 2004. Multivariable HRs for primary invasive breast cancer and 95% CIs were estimated by using Cox models.

RESULTS:

A decreased postmenopausal breast cancer risk was associated with current (HR: 0.82; 95% CI: 0.69, 0.97) but not past (HR: 1.10; 95% CI: 0.92, 1.31) vitamin D supplementation (P-homogeneity = 0.02). The association with current vitamin D supplementation differed according to MHT use: ever users (HR: 0.74; 95% CI: 0.60, 0.90) and never users (HR: 1.13; 95% CI: 0.89, 1.56); P-homogeneity = 0.02.

CONCLUSIONS:

In this observational study, current vitamin D supplementation, mostly taken daily and combined with calcium, was associated with a decreased postmenopausal breast cancer risk in MHT users. These findings should be confirmed before considering vitamin D supplementation to partly balance the MHT-associated increased breast cancer risk.

KEYWORDS: MHT; breast cancer; calcitriol; cohort; estrogen; menopausal hormone therapy; menopause; prospective study; supplements; vitamin D

PMID:26354532