

ABSTRACTS

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2. LBP

PT vs Chiro

J Health Psychol. 2016 Jan 10. pii: 1359105315621781.

Cognitive representations in low back pain in patients receiving chiropractic versus physiotherapy treatment.

Roiros E¹, Paredes AC¹, Alves AF², Pereira MG³.

Author information

Abstract

This study focused on cognitive representations of low back pain patients receiving chiropractic (n = 213) versus physiotherapy treatment (n = 125). Variables assessed included satisfaction with care, illness perceptions, beliefs about pain and medicines, attitudes towards doctors and medicine, suffering, adherence and functional incapacity. In the chiropractic treatment, functional incapacity was predicted by painful symptoms, suffering and personal control, and in the physiotherapy treatment by age, pain intensity, positive suffering, care satisfaction, illness identity and medication adherence. The groups differed on all cognitive variables assessed. Interventions should take into consideration cognitive dimensions, across treatment modalities.

KEYWORDS: chiropractic; cognitive representations; functional incapacity; low back pain; physiotherapy

PMID: 26755560

7. PELVIC ORGANS/WOMAN'S HEALTH

Male pelvic pain

Year : 2016 | Volume : 32 | Issue : 1 | Page : 34-39

Male chronic pelvic pain: An update

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Introduction: Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) and interstitial cystitis/bladder pain syndrome collectively referred to as urologic CPPS (UCPPS) is defined by the absence of identifiable bacterial infection as a cause for the chronic pain and urinary symptoms.

Methods: A PubMed search of all recent relevant articles using the keywords/phrases: CPPS, CPPS, and male pelvic pain, was conducted.

Results: CPPS has a high worldwide prevalence and its negative impact on quality of life compares with or exceeds common chronic morbidities. Triggers include certain comestibles as well as psychosocial factors that promote catastrophizing and illness focused behavior. Several validated tools are currently available to help diagnose and direct targeted therapy. Treatment should begin with the most simple and least invasive based on the presenting clinical phenotype.

Conclusions: Although no gold-standard treatment exists, a multidisciplinary approach with multimodal therapy gives the UCPPS patient the best chance of symptom relief.

Keywords: Chronic pelvic pain syndrome, male pelvic pain, prostatitis

Bone density

Bone. 2015 Dec 30;84:113-119. doi: 10.1016/j.bone.2015.12.054.

Eating disorders, menstrual dysfunction, weight change and DMPA use predict bone density change in college-aged women.

Nieves JW¹, Ruffing JA², Zion M³, Tendy S⁴, Yavorek T⁴, Lindsay R⁵, Cosman F⁵.

Author information

Abstract

INTRODUCTION:

There are limited longitudinal studies that have evaluated bone mineral density (BMD) changes in college-aged women. Our objective was to simultaneously evaluate factors influencing 4-year BMD change.

METHODS:

This was a longitudinal cohort study of healthy, physically active women in the US Military Academy (n=91; average age=18.4years). Assessments over four years included: height, weight, calcium intake, physical fitness, menstrual function (annual number cycles), oral contraceptives (OCs) or depot-medroxyprogesterone acetate (DMPA) use, and eating disorder behavior (Eating Disorder Inventory; (EDI)). BMD was measured annually at the lumbar spine and total hip by dual X-ray absorptiometry and calcaneal BMD by PIXI. Slope of 4year BMD change at each skeletal site (spine total hip and calcaneus) was calculated for each woman.

RESULTS:

BMD gains occurred at the spine in 50% and the hip in 36% of women. In unadjusted analyses, spine bone gain was positively related to menstrual cycle frequency (p=0.04). Spine and hip BMD loss occurred in those using DMPA (p<0.01) and those with the highest EDI quartile scores (p<0.05). BMD change was unrelated to OC use. Hip and calcaneus BMD decreased with weight loss (average 4.8+2.2lb/year) as compared to those with stable weight/weight gain (p<0.05). In multivariable analysis, spine BMD increase was significantly related to African American (AA) race, normal EDI score and normal menses. Hip BMD increase was related to AA race, weight increase and normal menses. DMPA use was associated with spine, hip, and calcaneus bone loss.

CONCLUSION:

On average, BMD may modestly increase in college-aged women, in the absence of risk factors. However, risk factors including subclinical eating disorders, weight loss, menstrual dysfunction and DMPA use can have significant detrimental effects on BMD in young healthy physically active women.

KEYWORDS: DMPA; Eating disorders; Menstrual dysfunction; Oral contraceptives; Peak bone mass; Weight loss

PMID: 26746778

8. VISCERA

IBS pain

J Neuroendocrinol. 2016 Jan 8. doi: 10.1111/jne.12361.

Mechanisms of stress-induced visceral pain: implications in irritable bowel syndrome.

Greenwood-Van Meerveld B^{1,2}, Moloney RD¹, Johnson AC¹, Vicario M^{3,4}.

Author information

Abstract

Visceral pain describes pain originating from the internal organs of the body and is a common feature of many disorders including irritable bowel syndrome (IBS). Stress is implicated in the development and exacerbation of many visceral pain disorders. Recent evidence suggests that stress and the gut microbiota can interact through complementary or opposing factors to influence visceral nociceptive behaviors. The presentation at this Young Investigator Forum at the International Society of Psychoneuroendocrinology (ISPNE) annual meeting described the experimental evidence by which the gut microbiota can affect the stress response to affect visceral pain. Building upon human imaging data showing abnormalities in that central processing of visceral stimuli in patients with IBS with the knowledge that the amygdala plays a pivotal role in facilitating the stress axis, we reviewed our latest experimental evidence supporting amygdala-mediated mechanisms in stress-induced visceral pain. The final part of the session at ISPNE reviewed experimental evidence that visceral pain in IBS may be due, at least in part, to afferent nerve sensitization following increases in epithelial permeability and mucosal immune activation. This article is protected by copyright. All rights reserved.

KEYWORDS: Amygdala; Corticotropin-Releasing Hormone; Irritable Bowel Syndrome; Mucosal Immunity; Stress; Visceral Hypersensitivity
PMID:26749172

10 A. CERVICAL SPINE**Joint position sense****Cervical joint position sense in neck pain. Immediate effects of muscle vibration versus mental training interventions: a RCT**

European Journal of Physical and Rehabilitation Medicine, 01/20/2016

Beinert K, et al.

The aim of the present study was to determine the short-term effects of neck muscle vibration, motor imagery, and action observation on cervical joint position sense and pressure pain threshold in people with chronic neck pain. Although motor imagery and action observation did not modulate proprioceptive, afferent input, they nevertheless improved cervical joint position sense acuity. This indicates that, against the common opinion, changes in proprioceptive input are not prerequisite to improve joint repositioning performance. However, the short-term applications of these cognitive treatments had no effect on pressure pain thresholds, whereas vibration reduced pressure pain thresholds. This implies different underlying mechanisms after vibration and mental training.

Methods

- Forty-five blinded participants with neck pain received concealed allocation and were randomized in three treatment groups. A blinded assessor performed pre- and post-test measurement.
- Patients were recruited from secondary outpatient clinics in the southwest of Germany.
-
- Chronic, non specific neck pain patients without arm pain were recruited for this study.
- A single intervention session of 5 minutes was delivered to each blinded participant. Patients were either allocated to one of the following three interventions: 1) neck muscle vibration; 2) motor imagery; 3) action observation.
- Primary outcomes were cervical joint position sense acuity and pressure pain threshold.
- Repeated measures ANOVAs were used to evaluate differences between groups and subjects.

Results

- Repositioning acuity displayed significant time effects for vibration, motor imagery, and action observation (all $P < 0.05$), but revealed no time*group effect.
- Pressure pain threshold demonstrated a time*group effect ($P = 0.042$) as only vibration significantly increased pressure pain threshold ($P = 0.01$)

11. UPPER C SPINE

Basilar invagination

BMC Musculoskelet Disord. 2016 Jan 11;17(1):7. doi: 10.1186/s12891-015-0847-0.

Basilar impression presenting as intermittent mechanical neck pain: a rare case report.

Mourad F¹, Giovannico G², Maselli F^{3,4}, Bonetti F⁵, Fernández de Las Peñas C⁶, Dunning J^{7,8}.
Author information

Abstract

BACKGROUND:

Neck pain is one of the most common musculoskeletal disorders in clinical practice. However neck pain may mask more serious pathology. Although uncommon in most musculoskeletal physiotherapy practices, it is possible to encounter rare and extremely life-threatening conditions, such as craniovertebral congenital anomalies. Basilar invagination is an abnormality where the odontoid peg projects above the foramen magnum and is the commonest malformation of the craniocervical junction. Its prevalence in the general population is estimated to be 1 %. Furthermore, it is a well-recognised cause of neck pain insomuch as it can be easily overlooked and mistaken for a musculoskeletal disorder. Diagnosis is based on the patient's symptoms in conjunction with magnetic resonance imaging (MRI). If life-threatening symptoms, or pressure on the spinal cord are present, the recommended treatment is typically surgical correction.

CASE PRESENTATION:

This case report describes the history, relevant examination findings, and clinical reasoning used for a 37 year old male who had the chief complaint of neck pain and occipital headache. After the history and the physical examination, there were several key indicators in the patient's presentation that appeared to warrant further investigation with diagnostic imaging: (1) the drop attack after a triggering event (i.e., heading a football), (2) several episodes of facial numbness immediately and shortly after the trauma, (3) the poorly defined muscle upper extremity muscle weakness, and (4) the modification of symptoms during the modified Sharp-Purser test. Therefore, the decision was made to contact the referring neurosurgeon to discuss the patient's history and his physical examination. The physician requested immediate cervical spine MRI, which revealed a "basilar impression".

CONCLUSION:

This case report highlights the need for more research into a number of issues surrounding the prevalence, diagnosis, and the central role of primary care clinicians such as physiotherapists. Furthermore it underlines the importance of including Basilar invagination in the differential diagnosis. Physiotherapists working within a direct access environment must take a comprehensive history and be capable of screening for non-musculoskeletal medical conditions (on a systems, not diagnosis level) in order to avoid providing potentially harmful musculoskeletal treatments (e.g., cervical mobilization or manipulation, stretching, exercise) to patients with sinister medical pathologies, not benign musculoskeletal disorders.

PMID:26754441

13. CRANIUM/TMJ

TMJ Manual Therapy

February 2016 Volume 21, Pages 10–17

Efficacy of musculoskeletal manual approach in the treatment of temporomandibular joint disorder: A systematic review with meta-analysis

Wagner Rodrigues Martins Juscelino Castro Blasczyk¹ Micaele Aparecida Furlan de Oliveira² Karina Ferreira Lagôa Gonçalves³ Ana Clara Bonini-Rocha⁴ Pierre-Michel Dugailly Ricardo Jacó de Oliveira⁵

Highlights

- Musculoskeletal manipulations approaches are effective for the treatment of TMJ.
- There is a larger effect for MMA compared to other conservative treatments.
- MMA have biomechanical and neurophysiological effects for the treatment of TMJ.

Abstract

Background: Temporomandibular joint disorder (TMD) requires a complex diagnostic and therapeutic approach, which usually involves a multidisciplinary management. Among these treatments, musculoskeletal manual techniques are used to improve health and healing.

Objectives: To assess the effectiveness of musculoskeletal manual approach in temporomandibular joint disorder patients.

Design: A systematic review with meta-analysis.

Methods: During August 2014 a systematic review of relevant databases (PubMed, The Cochrane Library, PEDro and ISI web of knowledge) was performed to identify controlled clinical trials without date restriction and restricted to the English language. Clinical outcomes were pain and range of motion focalized in temporomandibular joint. The mean difference (MD) or standard mean difference (SMD) with 95% confidence intervals (CIs) and overall effect size were calculated at every post treatment. The PEDro scale was used to demonstrate the quality of the included studies.

Results/findings: From the 308 articles identified by the search strategy, 8 articles met the inclusion criteria. The meta-analysis showed a significant difference ($p < 0.0001$) and large effect on active mouth opening (SMD, 0.83; 95% CI, 0.42 to 1.25) and on pain during active mouth opening (MD, 1.69; 95% CI, 1.09 to 2.30) in favor of musculoskeletal manual techniques when compared to other conservative treatments for TMD.

Conclusions: Musculoskeletal manual approaches are effective for treating TMD. In the short term, there is a larger effect regarding the latter when compared to other conservative treatments for TMD.

Keywords: *Temporomandibular joint disorder, Manual therapy, Pain, Range of motion*

14. HEADACHES

Testing for CG HA's

February 2016 Volume 21, Pages 35–40

Physical examination tests for screening and diagnosis of cervicogenic headache: A systematic reviewJ. Rubio-Ochoa J. Benítez-Martínez E. Lluch S. Santacruz-Zaragoza P. Gómez-Contreras C.E. Cook²**Highlights**

- Clinometric properties of tests for cervicogenic headache (CGH) were reviewed.
- Diagnostic tests for CGH showed high levels of reliability and diagnostic accuracy.
- The cervical flexion-rotation test is the most reliable and accurate for CGH.

Abstract

It has been suggested that differential diagnosis of headaches should consist of a robust subjective examination and a detailed physical examination of the cervical spine. Cervicogenic headache (CGH) is a form of headache that involves referred pain from the neck. To our knowledge, no studies have summarized the reliability and diagnostic accuracy of physical examination tests for CGH. The aim of this study was to summarize the reliability and diagnostic accuracy of physical examination tests used to diagnose CGH. A systematic review following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines was performed in four electronic databases (MEDLINE, Web of Science, Embase and Scopus). Full text reports concerning physical tests for the diagnosis of CGH which reported the clinometric properties for assessment of CGH, were included and screened for methodological quality. *Quality Appraisal for Reliability Studies* (QAREL) and *Quality Assessment of Studies of Diagnostic Accuracy* (QUADAS-2) scores were completed to assess article quality. Eight articles were retrieved for quality assessment and data extraction. Studies investigating diagnostic reliability of physical examination tests for CGH scored poorer on methodological quality (higher risk of bias) than those of diagnostic accuracy. There is sufficient evidence showing high levels of reliability and diagnostic accuracy of the selected physical examination tests for the diagnosis of CGH. The cervical flexion-rotation test (CFRT) exhibited both the highest reliability and the strongest diagnostic accuracy for the diagnosis of CGH.

Keywords: Cervicogenic headache, Physical examination, Diagnostic accuracy, Reliability

Mindfulness in tension HA

Effects of mindfulness-based stress reduction on perceived stress and psychological health in patients with tension headache

Journal of Research in Medical Sciences, 01/18/2016

Omid A, et al. – Programs for improving health status of patients with illness related to pain, such as headache, are often still in their infancy. Mindfulness-based stress reduction (MBSR) is a new psychotherapy that appears to be effective in treating chronic pain and stress. This study evaluated efficacy of MBSR in treatment of perceived stress and mental health of client who has tension headache. MBSR could reduce stress and improve general mental health in patients with tension headache.

Methods

- This study is a randomized clinical trial.
- Sixty patients with tension type headache according to the International Headache Classification Subcommittee were randomly assigned to the Treatment As Usual (TAU) group or experimental group (MBSR).
- The MBSR group received eight weekly classes with 12-min sessions.
- The sessions were based on MBSR protocol.
- The Brief Symptom Inventory (BSI) and Perceived Stress Scale (PSS) were administered in the pre- and posttreatment period and at 3 months follow-up for both the groups.

Results

- The mean of total score of the BSI (global severity index; GSI) in MBSR group was 1.63 ± 0.56 before the intervention that was significantly reduced to 0.73 ± 0.46 and 0.93 ± 0.34 after the intervention and at the follow-up sessions, respectively ($P < 0.001$).
- In addition, the MBSR group showed lower scores in perceived stress in comparison with the control group at posttest evaluation.
- The mean of perceived stress before the intervention was 16.96 ± 2.53 and was changed to 12.7 ± 2.69 and 13.5 ± 2.33 after the intervention and at the follow-up sessions, respectively ($P < 0.001$).
- On the other hand, the mean of GSI in the TAU group was 1.77 ± 0.50 at pretest that was significantly reduced to 1.59 ± 0.52 and 1.78 ± 0.47 at posttest and follow-up, respectively ($P < 0.001$).
- Also, the mean of perceived stress in the TAU group at pretest was 15.9 ± 2.86 and that was changed to 16.13 ± 2.44 and 15.76 ± 2.22 at posttest and follow-up, respectively ($P < 0.001$).

16. CONCUSSIONS

Orthostatic intolerance

Clin J Sport Med. 2016 Jan;26(1):40-5. doi: 10.1097/JSM.0000000000000183.

Orthostatic Intolerance and Autonomic Dysfunction in Youth With Persistent Postconcussion Symptoms: A Head-Upright Tilt Table Study.

Heyer GL¹, Fischer A, Wilson J, MacDonald J, Cribbs S, Ravindran R, Pommering TL, Cuff S.
Author information

Abstract

OBJECTIVE:

To explore head-upright tilt table (HUT) signs of autonomic dysfunction in a cohort of youth with persistent postconcussion symptoms (PCSs) that include light-headedness and to correlate repeat tilt table results with symptom improvements for those patients found to have postural tachycardia syndrome (POTS) on initial testing.

DESIGN:

Prospective cohort design.

SETTING:

Nationwide Children's Hospital, Neurology Clinic.

PARTICIPANTS:

Thirty-four patients (13-18 years of age) with persistent PCSs.

MAIN OUTCOME MEASURES:

All patients underwent at least 1 tilt table test. The PCS Interview (PCS-I) and patient ratings of light-headedness and vertigo were used to measure symptom burden. Patients found to have POTS were asked to repeat tilt table testing when PCSs improved or 3 to 6 months after the initial test if symptoms persisted.

RESULTS:

Twenty-four of the 34 (70.6%) patients had abnormal tilt table results with patients categorized as normal (n = 10), isolated syncope (n = 10), and POTS (n = 14). Patients with POTS had higher PCS-I scores than normal patients (P < 0.001) and higher ratings of light-headedness than both normal patients (P = 0.015) and syncope patients (P = 0.04). Twelve POTS patients underwent repeat tilt table testing, and 9 of 12 (75%) no longer met POTS diagnostic criteria. All patients with resolution of POTS had corresponding improvements in PCSs, including light-headedness and vertigo.

CONCLUSIONS:

Our study demonstrates a high rate of tilt table abnormalities among youth with persistent PCSs. Several patients with POTS had normalization of tilt table testing when PCSs improved. These findings warrant further research of autonomic dysfunction related to concussion.

CLINICAL RELEVANCE:

Our study is the first to prospectively characterize autonomic dysfunction in patients with persistent PCSs using HUT testing and to show that the tilt test abnormalities normalize in some patients as PCSs improve.

PMID:25706664

Cognitive assessment

Clin J Sport Med. 2016 Jan;26(1):46-52. doi: 10.1097/JSM.0000000000000185.

Relationship Between Cognitive Assessment and Balance Measures in Adolescents Referred for Vestibular Physical Therapy After Concussion.

Alsalaheen BA¹, Whitney SL, Marchetti GF, Furman JM, Kontos AP, Collins MW, Sparto PJ.
Author information

Abstract

OBJECTIVE: To examine the relationship between cognitive and balance performance in adolescents with concussion.

DESIGN: Retrospective case series.

SETTING: Tertiary.

PATIENTS: Sixty patients.

INTERVENTIONS: Correlation analyses were performed to describe the relationship between symptoms, cognitive measure, and balance measure at the time of initiation of vestibular physical therapy.

MAIN OUTCOME MEASURES: Cognitive performance was assessed using the Immediate Post-concussion Assessment and Cognitive Testing (ImPACT). The dizziness and balance function measures included dizziness severity rating, Activities-specific Balance Confidence scale (ABC), Dizziness Handicap Inventory (DHI), Functional Gait Assessment, gait speed, Timed "UP and GO," Five Times Sit to Stand, and Sensory Organization Test (SOT). To account for multiple comparisons, the False Discovery Rate method was used.

RESULTS: Performance measures of balance were significantly correlated with cognitive measures. Greater total symptom scores were related to greater impairment in the ABC and DHI ($r = 0.35-0.39$, $P \leq 0.008$) and worse performance in condition 2 of the SOT ($r = -0.48$, $P = 0.004$). Among the ImPACT composite scores, lower memory scores were correlated with impaired balance performance measures ($r = 0.37-0.59$, $P \leq 0.012$). Lower visual memory was also correlated with worse ABC scores.

CONCLUSIONS: The significant relationships reported between the cognitive performance scores and balance measures may reflect that similar levels of functioning exist across domains in individuals with protracted recovery who receive vestibular physical therapy.

CLINICAL RELEVANCE: The weak-to-moderate relationships warrant the continuous use of multiple domains of assessment. A better understanding to the relationships between the domains of functioning after concussion may improve the overall management approach for adolescents with concussion.

PMID:25706663

Higher altitudes increase

J Orthop Sports Phys Ther. 2016 Jan 11:1-24.

Division I College Football Concussion Rates Are Higher at Higher Altitudes.

Lynall RC^{1,2}, Kerr ZY³, Parr MS¹, Hackney AC^{2,4,5}, Mihalik JP^{1,2,6}.

Author information

Abstract

Study Design Retrospective cohort. **Background** Participating in sports at high altitude may have a protective effect on the brain according to research studies. Research using validated data collection methods in a previously unexplored cohort may better estimate the association between concussion injury risk and altitude.

Objectives To determine the association between concussion rates and altitude during college football games. **Methods** Athletic trainers from 21 Division I football programs provided exposure and injury data to the NCAA Injury Surveillance Program from the 2009/10 to 2013/14 academic years. Elevations for each stadium were determined. Concussion rates per 1000 athlete-exposures (AEs) were compared in two ways based on our sample of stadium elevations: 1) median split (elevation >178 m vs. <178 m); and 2) quartile split. Rate ratios (RR), rate differences, and 95% confidence intervals (CI) were computed.

Results 169 concussions were reported over 49040 AE (3.45/1000 AEs). Using the median split, the concussion rate above 178 m (4.18/1000 AEs) was 1.47 times the concussion rate below 178 m (2.84/1000 AEs; RR 95% CI: 1.09, 2.00; P=0.01). The concussion rate at the highest altitude quartile (>284 m; 5.01/1000 AEs) was 1.67 times greater than the concussion rate at the lowest altitude quartile (<43 m; 3.00/1000 AEs; RR 95% CI: 1.13, 2.48; P=0.01).

Conclusion College football game concussion rates appear to increase at higher altitudes. The clinical significance of this relatively small increase is unknown. Future research should explore potential physiologic underpinnings associated with concussion risk at relatively higher and lower altitudes. **Level of Evidence** Prognosis, level 2b. J Orthop Sports Phys Ther, Epub 11 Jan 2016. doi:10.2519/jospt.2016.6315.

KEYWORDS: elevation; mild traumatic brain injury; sports epidemiology; sports injury
PMID: 26755407

17. SHOULDER GIRDLE**Shoulder girdle muscles**

J Hand Surg Am. 2015 Nov 15. pii: S0363-5023(15)00841-2. doi: 10.1016/j.jhsa.2015.06.123.

Scapular and Shoulder Girdle Muscular Anatomy: Its Role in Periscapular Tendon Transfers.

Crowe MM¹, Elhassan BT².
Author information

Abstract

The importance of coordinated, normal scapulothoracic motion in facilitating full, pain-free motion of the shoulder complex has been increasingly studied over the past decade, leading to renewed interest in scapular-based reconstructions to improve shoulder girdle motion through the use of muscle advancements and tendon transfers. This article will review recent advances regarding scapulothoracic motion and the muscular stabilizers of the scapula, focusing on clinical diagnosis and anatomy as it pertains to scapular dyskinesis and common periscapular tendon transfers. Although many of these treatment techniques remain in their infancy and further follow-up is necessary before universal adoption, they provide a novel means of addressing difficult-to-treat and complex shoulder girdle pathologies.

KEYWORDS: Scapula; rhomboids; scapular musculature; serratus; trapezius
PMID: 26754193

19. GLENOHUMERAL/SHOULDER

Pain and distress

Psychological Distress Is Associated with Greater Perceived Disability and Pain in Patients Presenting to a Shoulder Clinic

Mariano E. Menendez, MD; Dustin K. Baker, BS; Lasun O. Oladeji, MS; Charles T. Fryberger, BS; Gerald McGwin, PhD; Brent A. Ponce, MD

J Bone Joint Surg Am, 2015 Dec 16; 97 (24): 1999 -2003 .
<http://dx.doi.org/10.2106/JBJS.O.00387>

Background: Shoulder disorders are a common cause of disability and pain. The Shoulder Pain and Disability Index (SPADI) is a frequently employed and previously validated measure of shoulder pain and disability. Although the SPADI has high reliability and construct validity, greater differences between individual patients are often observed than would be expected on the basis of diagnosis and pathophysiology alone. This study aims to determine how psychological factors (namely depression, catastrophic thinking, and self-efficacy) affect pain and perceived disability in the shoulder.

Methods: A cohort of 139 patients completed a sociodemographic survey and elements from the SPADI, Pain Self-Efficacy Questionnaire (PSEQ), Pain Catastrophizing Scale (PCS), and Patient Health Questionnaire Depression Scale (PHQ-2). Bivariate and multivariate analyses were performed to determine the association of psychosocial factors, demographic characteristics, and specific diagnosis with shoulder pain and disability.

Results: The SPADI score showed medium correlation with the PCS ($r = 0.43$; $p < 0.001$), PHQ-2 ($r = 0.39$; $p < 0.001$), and PSEQ ($r = -0.45$; $p < 0.001$). Current work status ($F = 4.35$; $p = 0.006$) and body mass index ($r = 0.27$; $p = 0.002$) were also associated with the SPADI score. In the multivariate analysis, greater catastrophic thinking (estimate, 0.003; $p = 0.029$), lower self-efficacy (estimate, -0.005 ; $p = 0.001$), higher body mass index (estimate, 0.006; $p = 0.048$), and being disabled (estimate, 0.15; $p = 0.017$) or retired (estimate, 0.16; $p < 0.001$) compared with being employed were associated with worse SPADI scores. The primary diagnosis did not have a significant relationship ($p > 0.05$) with the SPADI.

Conclusions: Catastrophic thinking and decreased self-efficacy are associated with greater shoulder pain and disability. Our data support the notion that patient-to-patient variation in symptom intensity and magnitude of disability is more strongly related to psychological distress than to the specific shoulder diagnosis.

Level of Evidence: Prognostic Level III. See Instructions for Authors for a complete description of levels of evidence.

25. WRIST AND HAND**Intrinsic vs. extrinsic function**

J Hand Surg Eur Vol. 2016 Jan 7. pii: 1753193415619774.

Extrinsic versus intrinsic hand muscle dominance in finger flexion.

Al-Sukaini A¹, Singh HP¹, Dias JJ².

Author information

Abstract

This study aims to identify the patterns of dominance of extrinsic or intrinsic muscles in finger flexion during initiation of finger curl and mid-finger flexion. We recorded 82 hands of healthy individuals (18-74 years) while flexing their fingers and tracked the finger joint angles of the little finger using video motion tracking. A total of 57 hands (69.5%) were classified as extrinsic dominant, where the finger flexion was initiated and maintained at proximal interphalangeal and distal interphalangeal joints. A total of 25 (30.5%) were classified as intrinsic dominant, where the finger flexion was initiated and maintained at the metacarpophalangeal joint. The distribution of age, sex, dominance, handedness and body mass index was similar in the two groups. This knowledge may allow clinicians to develop more efficient rehabilitation regimes, since intrinsic dominant individuals would not initiate extrinsic muscle contraction till later in finger flexion, and might therefore be allowed limited early active motion. For extrinsic dominant individuals, by contrast, initial contraction of extrinsic muscles would place increased stress on the tendon repair site if early motion were permitted.

KEYWORDS: Finger flexion; extrinsic hand muscles; hand rehabilitation; intrinsic hand muscles

PMID: 26744509

30 A. IMPINGEMENT**Cam bone**

Osteoarthritis Cartilage. 2016 Jan 13. pii: S1063-4584(16)00009-1. doi: 10.1016/j.joca.2016.01.003.

Femoral Subchondral Bone Properties of Patients with Cam-Type Femoroacetabular Impingement.

Haider I¹, Speirs A², Alnabelseya A³, Beaulé PE⁴, Frei H⁵.
Author information

Abstract

OBJECTIVE:

Morphological deformities of the hip, such as femoroacetabular impingement may be responsible for up to 80% of hip osteoarthritis. In cam type FAI, the pathomechanism has been attributed to repeated abnormal contact between the femur and the antero-superior acetabular rim, resulting in cartilage and labrum degeneration. Subchondral bone stiffness likely plays a major role in the process, but little is known of the mechanical properties of the cam deformity. The purpose of this study was to determine tissue modulus and the trabecular micro-architecture of the subchondral bone of the cam deformity of patients undergoing resection surgery as well as comparing these parameters to healthy aged matched controls.

DESIGN:

Twelve osteochondral bone biopsies were obtained from symptomatic FAI patients and ten osteochondral control specimens were harvested from cadaveric femurs. A combination of mechanical testing, micro-CT and finite element analysis were used to determine tissue modulus, bone volume fraction, trabecular thickness, trabecular and spacing, and trabecular number.

RESULTS:

The mean tissue modulus of the cam-type FAI deformities ($E= 5.4$ GPa) was significantly higher than normal controls ($E= 2.75$ GPa, $p=0.038$), but no statistically significant differences were found in bone micro-architectural parameters.

CONCLUSIONS:

The data suggests that subchondral bone of the cam deformity consists of older secondary mineralized bone. This supports the notion that the cam deformity is a primary malformation with intrinsic biomechanical abnormalities rather than a secondary deformity as part of the degenerative process of the covering cartilage or remodeling due to repeated impingement.

KEYWORDS: Femoroacetabular impingement; finite element; subchondral bone; tissue modulus

PMID:26774735

31. KNEE**Anterolateral lig**

Knee. 2015 Dec 31. pii: S0968-0160(15)00224-0. doi: 10.1016/j.knee.2015.09.014.

The anterolateral ligament of the knee: A dissection study.

Runer A¹, Birkmaier S², Pamminer M³, Reider S⁴, Herbst E⁵, Künzel KH⁶, Brenner E⁷, Fink C⁸.
Author information

Abstract

BACKGROUND:

Recent studies have described the presence of the anterolateral ligament (ALL). However, there is still no consensus regarding the anatomy of this structure with the topic controversially discussed. The aim of this study was to provide an anatomical description of the ligamentous structures on the anterolateral side of the knee with special emphasis on the ALL.

METHODS:

Forty-four human cadaveric knees were dissected to reveal the ALL and other significant structures in the anterolateral compartment of the knee joint. The ALL was defined as a firm structure running in an oblique direction from the lateral femoral epicondyle to a bony insertion at the anterolateral tibia.

RESULTS:

The ALL was identified in 45.5% (n=20) of the dissected knee joints. The structure originates together with the fibular collateral ligament (45%) or just posterior and proximal to it (55%). The ligament has an extra-capsular, anteroinferior, oblique course to the anterolateral tibia with a bony insertion between Gerdy's tubercle and the fibular head. The ALL had its greatest extend at 60° of knee flexion and maximal internal rotation.

CONCLUSION:

The ALL is a firm ligamentous structure in the anterolateral part of the knee present in 45.5% of the cases. Given the course and characteristics of this structure, a function in providing rotational stability by preventing internal rotation of the knee is likely.

CLINICAL RELEVANCE:

The ALL might be an important stabilizer in the knee and may play a significant role in preventing excessive internal tibial rotation and subluxation of the knee joint.

KEYWORDS: ACL reconstruction; ALL; Anterolateral ligament; Extra-articular tenodesis; Knee instability; Pivot shift; Rotational stability
PMID: 26749203

32 A. KNEE/ACL**ACL Patella vs. hamstring**

Am J Sports Med. 2016 Jan;44(1):83-90. doi: 10.1177/0363546515611886. Epub 2015 Nov 17.

Comparison of Patellar Tendon and Hamstring Tendon Anterior Cruciate Ligament Reconstruction: A 15-Year Follow-up of a Randomized Controlled Trial.

Webster KE¹, Feller JA², Hartnett N², Leigh WB², Richmond AK².

Author information

Abstract

BACKGROUND:

Numerous studies have compared patellar tendon (PT) and hamstring tendon (HS) anterior cruciate ligament (ACL) reconstructions in the short to midterm, but fewer long-term results have been published.

HYPOTHESIS:

There will be no difference in functional outcome between ACL reconstruction performed with PT and HS grafts, but PT grafts will have more donor site morbidity.

STUDY DESIGN:

Randomized controlled trial; Level of evidence, 1.

METHODS:

Sixty-five patients undergoing ACL reconstruction were randomized to receive either a PT graft or a 4-strand HS graft. Early results were reported at 4, 8, 12, 24, and 36 months. Forty-seven patients (22 of 31 PT and 25 of 34 HS) were reviewed at a mean of 15.3 years.

RESULTS:

Four graft ruptures (1 PT, 3 HS) and 6 contralateral ACL injuries (4 PT, 2 HS) occurred in the group that was reviewed. There was no statistically significant difference between the groups for any of the variables measured. There was a similar incidence of anterior knee pain and kneeling pain in both groups. The previously observed increased extension deficit in the PT group at 3 years was not present at 15 years, and there was no significant between-group difference in knee laxity. A higher proportion of patients in the PT group were participating in sport on a weekly basis (73% PT, 48% HS; $P = .05$). There was no difference in the degree of osteoarthritis between the groups.

CONCLUSION:

This randomized controlled trial showed that HS and PT ACL reconstructions have comparable results at an average 15-year follow-up. Contrary to the study hypothesis, some of the graft differences seen at earlier review were not present at 15 years, and patients with PT grafts were more active in sport participation. Overall, both graft types provided good long-term subjective and objective outcomes.

KEYWORDS: anterior cruciate ligament (ACL) reconstruction; hamstring tendon; long-term follow-up; patellar tendon

PMID: 26578718

Tobacco use increases problems

Am J Sports Med. 2016 Jan;44(1):99-104. doi: 10.1177/0363546515610505. Epub 2015 Nov 2.

Tobacco Use Is Associated With Increased Complications After Anterior Cruciate Ligament Reconstruction.

Cancienne JM¹, Gwathmey FW¹, Miller MD¹, Werner BC².

Author information

Abstract

BACKGROUND: The use of tobacco is a well-established cause of preventable morbidity and mortality. There have been few studies examining the effect of tobacco use on outcomes and complications after arthroscopic knee procedures such as anterior cruciate ligament (ACL) reconstruction.

PURPOSE: To investigate the relationship between tobacco use and rates of postoperative infection, venous thromboembolism (VTE), arthrofibrosis, and subsequent ACL reconstruction after primary ACL reconstruction.

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

METHODS: A national insurance database was queried for patients who underwent arthroscopic-assisted ACL reconstruction using Current Procedural Terminology code 29888. Patients underage for tobacco use in all regions of the United States (age <20 years), those with prior ACL reconstruction, and those with the following concomitant procedures were excluded: open cruciate or collateral ligament reconstruction, open or arthroscopic cartilage procedures, patellar stabilization, extra-articular ligamentous reconstruction, and posterior cruciate ligament reconstruction. Tobacco use and non-tobacco use cohorts were queried using International Classification of Diseases-9th Revision coding. The non-tobacco use patients were then matched to the patients with coded tobacco use by age, sex, obesity, diabetes, meniscal repair, and meniscectomy. Complications within 90 days postoperatively were assessed for both cohorts, including infection, VTE, arthrofibrosis, and subsequent ipsilateral or contralateral ACL reconstruction after the index procedure.

RESULTS: A total of 13,358 patients who underwent ACL reconstruction met inclusion and exclusion criteria, including 1659 patients with documented tobacco use and 11,699 matched controls. The incidence of infection was significantly higher in patients who use tobacco (2.0%) versus matched controls (0.9%; odds ratio [OR], 2.3; $P < .0001$). The rate of VTE was also significantly higher in patients who use tobacco (1.0%) compared with matched controls (0.5%; OR, 1.9; $P = .035$). The rate of subsequent ACL reconstruction was significantly higher in the tobacco use cohort (12.6%) compared with matched controls (7.8%; OR, 1.7; $P < .0001$). There was no significant difference in the rate of postoperative stiffness after ACL reconstruction between patients who use tobacco (2.0%) and matched controls (2.3%; OR, 0.9; $P = .656$).

CONCLUSION: ACL reconstruction in patients who use tobacco is associated with significantly increased rates of infection, VTE, and subsequent ACL reconstruction compared with controls. There was no association between tobacco use and postoperative arthrofibrosis after primary ACL reconstruction.

KEYWORDS: ACL reconstruction; VTE; infection; smoking; stiffness; tobacco

PMID: 26526974

Hip strength and injury

Am J Sports Med. 2015 Dec 8. pii: 0363546515616237.

Hip Muscle Strength Predicts Noncontact Anterior Cruciate Ligament Injury in Male and Female Athletes: A Prospective Study.

Khayambashi K1, Ghoddosi N1, Straub RK2, Powers CM3.

BACKGROUND:

Prospective studies have reported that abnormal movement patterns at the trunk, hip, and knee are associated with noncontact anterior cruciate ligament (ACL) injuries. Impaired hip strength may underlie these abnormal movement patterns, suggesting that diminished hip strength may increase the risk of noncontact ACL injury.

PURPOSE:

To determine whether baseline hip strength predicts future noncontact ACL injury in athletes.

STUDY DESIGN:

Case-control study; Level of evidence, 3.

METHODS:

Before the start of the competitive season, isometric hip strength (external rotation and abduction) was measured bilaterally by use of a handheld dynamometer in 501 competitive athletes (138 female and 363 male athletes) participating in various sports. During the sport season, ACL injury status was recorded, and injured athletes were further classified based on the mechanism of injury (noncontact vs contact). After the season, logistic regression was used to determine whether baseline hip strength predicted future noncontact ACL injury. Receiver operating characteristic (ROC) curves were constructed independently for each strength measure to determine the clinical cutoff value between a high-risk and low-risk outcome.

RESULTS:

A total of 15 noncontact ACL injuries were confirmed (6 females, 9 males), for an overall annual incidence of 3.0% (2.5% for males, 4.3% for females). Baseline hip strength measures (external rotation and abduction) were significantly lower in injured athletes compared with noninjured athletes ($P = .003$ and $P < .001$, respectively). Separate logistic regression models indicated that impaired hip strength increased future injury risk (external rotation: odds ratio [OR] = 1.23 [95% CI, 1.08-1.39], $P = .001$; abduction: OR = 1.12 [95% CI, 1.05-1.20], $P = .001$). Clinical cutoffs to define high risk were established as external rotation strength $\leq 20.3\%$ BW (percentage of body weight) or abduction strength $\leq 35.4\%$ BW.

CONCLUSION:

Measures of preseason isometric hip abduction and external rotation strength independently predicted future noncontact ACL injury status in competitive athletes. The study data suggest that screening procedures to assess ACL injury risk should include an assessment of isometric hip abduction and/or external rotation strength.

KEYWORDS: anterior cruciate ligament (ACL) injury; hip abduction strength; hip external rotation strength; knee injury prevention; noncontact; prospective study

33. MENISCUS

Progression of tears

BMC Musculoskelet Disord. 2016 Jan 5;17(1):4. doi: 10.1186/s12891-015-0862-1.

Natural history and clinical significance of meniscal tears over 8 years in a midlife cohort.

Khan HI¹, Aitken D², Ding C³, Blizzard L⁴, Pelletier JP⁵, Martel-Pelletier J⁶, Cicuttini F⁷, Jones G⁸.

Author information

Abstract

BACKGROUND:

There is limited longitudinal data available on the natural history of meniscal tears especially in middle-aged adults with a low prevalence of osteoarthritis (OA). The aim of this study was to describe the natural history of meniscal tears over 8 years and the relationship with change in knee pain and structures.

METHODS:

One hundred ninety eight participants [mean age 47 (28-63); 57 % female] were studied at baseline and 8 years later. Approximately half were the adult offspring of subjects who had a knee replacement performed for knee OA and the remainder were randomly selected controls. Meniscal tears/extrusion, cartilage volume/defects, bone marrow lesions (BMLs) and effusion were assessed on MRI. Knee pain was assessed using the Western Ontario and McMaster Universities Osteoarthritis Index.

RESULTS:

22 % of the participants had at least one meniscal tear at any site at baseline. Over 8 years, 16 % of the participants had an increase in severity of meniscal tears while none improved. Increase in meniscal tear score was associated with worsening knee pain ($\beta = +2.81 (+1.40, +4.22)$), with offspring having a significantly greater increase in pain severity compared to controls. BMI and presence of osteophytes at baseline, but not knee injury, predicted change in tears, whereas change in meniscal tears was independently associated with cartilage volume loss, change in BMLs and change in meniscal extrusion.

CONCLUSION:

Change in meniscal tears shares risk factors with knee OA and is independently associated with worsening knee pain and structural damage suggesting that meniscal tears are on the knee OA causal pathway.

PMID:26728980

34. PATELLA

Hip abductor strength

Am J Sports Med. 2016 Jan;44(1):105-12. doi: 10.1177/0363546515611632. Epub 2015 Nov 13.

Is Hip Abduction Strength Asymmetry Present in Female Runners in the Early Stages of Patellofemoral Pain Syndrome?

Plastaras C¹, McCormick Z², Nguyen C³, Rho M², Nack SH², Roth D⁴, Casey E⁵, Carneiro K⁶, Cucchiara A¹, Press J², McLean J⁷, Caldera F⁸.

Author information

Abstract

BACKGROUND: The current literature indicates that hip abduction weakness in female patients is associated with ipsilateral patellofemoral pain syndrome (PFPS) as part of the weaker hip abductor complex. Thus, it has been suggested that clinicians should consider screening female athletes for hip strength asymmetry to identify those at risk of developing PFPS to prevent the condition. However, no study to date has demonstrated that hip strength asymmetry exists in the early stages of PFPS.

PURPOSE: To determine whether hip abduction strength asymmetry exists in female runners with early unilateral PFPS, defined as symptoms of PFPS not significant enough to cause patients to seek medical attention or prevent them from running at least 10 miles per week.

STUDY DESIGN: Controlled laboratory study.

METHODS: This study consisted of 21 female runners (mean age, 30.5 years; range, 18-45 years) with early unilateral PFPS, who had not yet sought medical care and who were able to run at least 10 miles per week, and 36 healthy controls comparably balanced for age, height, weight, and weekly running mileage (mean, 18.5 mi/wk). Study volunteers were recruited using flyers and from various local running events in the metropolitan area. Bilateral hip abduction strength in both a neutral and extended hip position was measured using a handheld dynamometer in each participant by an examiner blinded to group assignment.

RESULTS: Patients with early unilateral PFPS demonstrated no significant side-to-side difference in hip abduction strength, according to the Hip Strength Asymmetry Index, in both a neutral (mean, 83.5 ± 10.2 ; $P = .2272$) and extended hip position (mean, 96.3 ± 21.9 ; $P = .6671$) compared with controls (mean, 87.0 ± 8.3 [$P = .2272$] and 96.6 ± 16.2 [$P = .6671$], respectively). Hip abduction strength of the affected limb in patients with early unilateral PFPS (mean, 9.9 ± 2.2 ; $P = .0305$) was significantly stronger than that of the weaker limb of control participants (mean, 8.9 ± 1.4 ; $P = .0305$) when testing strength in a neutral hip position; however, no significant difference was found when testing the hip in an extended position (mean, 7.0 ± 1.4 [$P = .1406$] and 6.6 ± 1.5 [$P = .1406$], respectively).

CONCLUSION: The study data show that early stages of unilateral PFPS in female runners is not associated with hip abduction strength asymmetry and that hip abduction strength tested in neutral is significantly greater in the affected limb in the early stages of PFPS compared with the unaffected limb. However, when tested in extension, no difference exists. Further studies investigating the early stages of PFPS are warranted.

CLINICAL RELEVANCE:

Unlike patients with PFPS seeking medical care, early PFPS does not appear to be significantly associated with hip abduction strength asymmetry.

KEYWORDS: dynamometer; muscle strength; patellofemoral syndrome; sports injury
 PMID:26566993

Altered mechanics in runners

Runners with patellofemoral pain have altered biomechanics which targeted interventions can modify: A systematic review and meta-analysis

Bradley S Neal Christian J Barton Rosa Gallie Patrick O'Halloran Dylan Morrissey

Highlights

- •Increased peak hip adduction is a risk factor for PFP development in female runners.
- •Significant associations were found between altered biomechanics and PFP in runners.
- •Increased forces at foot level are also a risk factor for PFP development in runners.
- •Running retraining and strengthening exercise improve pain in runners with PFP.
- •Running retraining works via a kinematic mechanism of reducing peak hip adduction.

Abstract

Patellofemoral pain (PFP) is the most prevalent running pathology and associated with multi-level biomechanical factors. This systematic review aims to guide treatment and prevention of PFP by synthesising prospective, observational and intervention studies that measure clinical and biomechanical outcomes in symptomatic running populations. Medline, Web of Science and CINAHL were searched from inception to April 2015 for prospective, case-control or intervention studies in running-related PFP cohorts. Study methodological quality was scored by two independent raters using the modified Downs and Black or PEDro scales, with meta-analysis performed where appropriate. 28 studies were included. Very limited evidence indicates that increased peak hip adduction is a risk factor for PFP in female runners, supported by moderate evidence of a relationship between PFP and increased peak hip adduction, internal rotation and contralateral pelvic drop, as well as reduced peak hip flexion. Limited evidence was also identified that altered peak force and time to peak at foot level is a risk factor for PFP development. Limited evidence from intervention studies indicates that both running retraining and proximal strengthening exercise lead to favourable outcomes in both pain and function, but only running retraining significantly reduces peak hip adduction, suggesting a possible kinematic mechanism. Put together, these findings highlight limited but coherent evidence of altered biomechanics which interventions can alter with resultant symptom change in females with PFP. There is a clear need for high quality prospective studies of intervention efficacy with measurement of explanatory mechanisms.

Keywords: Patellofemoral Pain, Kinematics, Kinetics, Risk Factors, Running, Systematic Review

Knee angle and PF pain

Scand J Med Sci Sports. 2015 Dec 29. doi: 10.1111/sms.12633.

Two-dimensional knee valgus displacement as a predictor of patellofemoral pain in adolescent females.

Holden S¹, Boreham C^{1,2}, Doherty C¹, Delahunt E^{1,2}.

Author information

Abstract

Patellofemoral pain (PFP) is a prevalent lower limb musculo-skeletal injury in adolescent females. Female athletes with PFP display increased frontal plane knee joint motion in comparison to control subjects. The current investigation aimed to determine prospectively whether two-dimensional knee valgus displacement during landing could predict the risk of developing PFP. Seventy-six injury-free adolescent female athletes (age = 12.9 ± 0.35 years) participated. At baseline participants performed three drop vertical jump trials from a 31-cm box. A standard video camera was used to record frontal plane knee joint kinematics. Over the 24-month follow-up, eight participants developed PFP, as diagnosed by a Chartered Physiotherapist. Knee valgus displacement was significantly increased in those who developed PFP compared to those who did not (mean difference = 7.79°; P = 0.002; partial eta squared = 0.07). Knee valgus displacement ≥ 10.6° predicted PFP with a sensitivity of 0.75 and specificity of 0.85. The associated positive likelihood ratio was 5.

These results have clinical utility suggesting that two-dimensional analysis could be implemented to screen for increased risk of PFP in adolescent female athletes.

KEYWORDS: Adolescent; biomechanics; kinematics; patellofemoral pain; prospective; risk factor

PMID:26712044

35. KNEE/TOTAL**Anterior knee pain**

Knee Surg Sports Traumatol Arthrosc. 2015 Dec 24.

Patella position is not a determinant for anterior knee pain 10 years after balanced gap total knee arthroplasty.

van Houten AH¹, Heesterbeek PJ², Wymenga AB².

Author information

Abstract

PURPOSE:

Incidence of anterior knee pain after total knee arthroplasty (TKA) is reported to be between 4 and 49 %. The incidence of AKP at long-term follow-up and possible determinants after cruciate cruciate-retaining TKA were investigated.

METHODS:

A 10-year follow-up of a cohort of 55 patients (63 TKAs), who received the balanSys™ cruciate-retaining total knee system (Mathys Ltd, Bettlach, Switzerland) between 1999 and 2002, was performed. Patients had undergone the balanced gap technique, with either a fixed bearing or an AP-glide bearing. Standardised diagnostic questions regarding AKP were collected and categorised into two groups: those with and without AKP. The lateral patellar tilt, patellar displacement measurement and modified Insall-Salvati ratio were used for patella position evaluation on skyline radiographs. The Knee Society Score (KSS), the Knee Osteoarthritis Outcome Score (KOOS) and Numerical Rating Scales (NRS) for pain and satisfaction were obtained at follow-up.

RESULTS:

Sixteen patients in the study population experienced AKP. Incidence of AKP (fixed bearing 13/44; AP-glide bearing bearing 3/17) was not dependent on type of insert (n.s.). There were no statistical differences in patella position and tibiofemoral contact point between the AKP group and the no AKP group (n.s.). KSS, KOOS, NRS-pain and NRS-satisfaction were significantly lower for the patients with AKP (all $p < 0.05$).

CONCLUSION:

Twenty-six percentage of the patients experienced AKP 10 years after balanced gap TKA. Postoperative patella positioning was not found to be a determinant for anterior knee pain after TKA. However, patellar displacement does not seem completely favourable. Moreover, type of bearing was not found a determinant for AKP at long-term follow-up.

LEVEL OF EVIDENCE:

Lower quality prospective cohort study (<80 % follow-up, patients enrolled at different time points in disease), Level II.

KEYWORDS: Anterior knee pain; Balanced gap technique; Knee arthroplasty; Patella position
PMID: 26704792

Hindfoot changes

Knee Surg Sports Traumatol Arthrosc. 2015 Dec 24.

Hindfoot alignment at one year after total knee arthroplasty.

Takenaka T¹, Ikoma K², Ohashi S¹, Arai Y¹, Hara Y¹, Ueshima K¹, Sawada K¹, Shirai T¹, Fujiwara H¹, Kubo T¹.

Author information

Abstract

PURPOSE:

It has previously been found that valgus hindfoot alignment (HFA) improves 3 weeks following total knee arthroplasty (TKA) for varus knee osteoarthritis (OA). In the present study, HFA was evaluated prior to TKA, as well as 3 weeks and 1 year following TKA. Using these multiple evaluations, the chronological effects of TKA on HFA were investigated.

METHODS:

The study included 71 patients (73 legs) who underwent TKA for varus knee OA. Radiograph examinations of the entire limb and hindfoot were performed in the standing position prior to TKA, as well as 3 weeks and 1 year following TKA. The varus-valgus angle was used as an indicator of HFA in the coronal plane. Patients were divided into two groups according to the preoperative varus-valgus angle: a hindfoot varus group (varus-valgus angle $<76^\circ$) and a hindfoot valgus group (varus-valgus angle $\geq 76^\circ$). The changes in the varus-valgus angle were evaluated and compared in both groups.

RESULTS:

In the hindfoot valgus group, the mean \pm standard deviation varus-valgus angle significantly declined from $80.5 \pm 3.1^\circ$ prior to TKA to $78.6 \pm 3.7^\circ$ 3 weeks following TKA and $77.1 \pm 2.7^\circ$ 1 year following TKA. However, in the hindfoot varus group, the mean varus-valgus angle prior to TKA ($72.7 \pm 2.6^\circ$) did not differ significantly from the mean varus-valgus angles 3 weeks ($72.3 \pm 3.3^\circ$) or 1 year ($73.5 \pm 3.0^\circ$) following TKA.

CONCLUSIONS:

HFA improved chronologically in legs with hindfoot valgus as a result of the alignment compensation ability of the hindfoot following TKA. However, no improvement was noted in legs with hindfoot varus because the alignment compensation ability of the hindfoot had been lost. The patients with hindfoot varus should be attended for ankle pain in the outpatient clinic after TKA.

LEVEL OF EVIDENCE: III.

KEYWORDS: Alignment compensation; Total knee arthroplasty; Varus knee osteoarthritis; Varus-valgus angle
PMID: 26704801

37. OSTEOARTHRITIS/KNEE**Importance of weight loss**

Arthritis Care Res (Hoboken). 2016 Jan 19. doi: 10.1002/acr.22805.

Is there a dose response relationship between weight loss and symptom improvement in persons with knee osteoarthritis?

Atukorala I¹, Makovey J², Lawler L³, Messier SP⁴, Bennell K⁵, Hunter DJ².
Author information

Abstract

OBJECTIVE:

We examined the dose-response relationship between weight reduction and pain/functional improvement in persons with symptomatic knee osteoarthritis (KOA) participating in a community-based weight loss program.

METHODS:

Consecutive participants with KOA enrolled in the 18-week "Osteoarthritis Healthy Weight for Life" weight loss program were selected. In this completer's type analysis, participants were assessed at baseline, 6 and 18 weeks for body weight and Knee Injury and Osteoarthritis Outcome Score (KOOS) subscales. The dose-response relationship between weight-change categories (>10%, 7.6-10%, 5.1-7.5%, 2.6-5.0% and <2.5% of body weight loss) and change in KOOS scores was assessed by repeated measures ANOVA controlling for gender and age, body mass index (BMI), and KOOS. The Western Ontario McMaster Universities Arthritis Index (WOMAC) function score derived from the KOOS was used to assess a meaningful clinical functional improvement.

RESULTS:

1383 (71% females) persons were enrolled. Mean (SD) age, height and weight was 64 (8.7) years, 1.66 (0.09)m and 95.1 (17.2)kg respectively. Mean BMI was 34.4 (5.2) with 82% of participants obese at baseline. 1304 (94%) achieved a >2.5% reduction in body weight. There was a significant dose-response relationship between all KOOS subscales and percentage of weight change across all weight change categories. Participants required $\geq 7.7\%$ (95% CI 5.2-13.3) body weight loss to achieve a minimal clinically important improvement in function.

CONCLUSIONS:

There is a significant dose-response relationship between percentage weight loss and symptomatic improvement. This study confirms the feasibility of weight loss as a therapeutic intervention in KOA in a community-based setting. This article is protected by copyright. All rights reserved.

KEYWORDS: Osteoarthritis; management; prevention; progression
PMID:26784732

Effectiveness of exercise

J Geriatr Phys Ther. 2016 Jan-Mar;39(1):38-48. doi: 10.1519/JPT.0000000000000045.

Effect of Home Exercise Program in Patients With Knee Osteoarthritis: A Systematic Review and Meta-analysis.

Anwer S¹, Alghadir A, Brismée JM.
Author information

Abstract

BACKGROUND:

The Osteoarthritis Research Society International recommended that nonpharmacological methods include patient education programs, weight reduction, coping strategies, and exercise programs for the management of knee osteoarthritis (OA). However, neither a systematic review nor a meta-analysis has been published regarding the effectiveness of home exercise programs for the management of knee OA.

PURPOSE:

The purpose of this systematic review was to examine the evidence regarding the effect of home exercise programs with and without supervised clinic-based exercises in the management of knee OA.

METHODS:

We searched PubMed, CINAHL, Embase, Scopus, and PEDro for research articles published prior to September 2014 using key words such as pain, exercise, home exercise program, rehabilitation, supervised exercise program, and physiotherapy in combination with Medical Subject Headings "Osteoarthritis knee." We selected randomized and case-controlled trials published in English language. To verify the quality of the selected studies, we applied the PEDro Scale. Two evaluators individually selected the studies based on titles, excluding those articles that were not related to the objectives of this review. One evaluator extracted data from the included studies. A second evaluator independently verified extracted data for accuracy.

RESULTS:

A total of 31 studies were found in the search. Of these, 19 studies met the inclusion criteria and were further analyzed. Seventeen of these 19 studies reached high methodological quality on the PEDro scale. Although the methods and home exercise program interventions varied widely in these studies, most found significant improvements in pain and function in individuals with knee OA.

DISCUSSIONS:

The analysis indicated that both home exercise programs with and without supervised clinic-based exercises were beneficial in the management of knee OA.

CONCLUSIONS:

The large evidence of high-quality trials supports the effectiveness of home exercise programs with and without supervised clinic-based exercises in the rehabilitation of knee OA. In addition, small but growing evidence supports the effectiveness of other types of exercise such as tai chi, balance, and proprioceptive training for individuals with knee OA.

PMID:25695471

Placebo impact

Osteoarthritis Cartilage. 2016 Jan 13. pii: S1063-4584(16)00008-X. doi: 10.1016/j.joca.2016.01.002.

Short-term placebo response in trials of patients with symptomatic osteoarthritis: differences between hip and knee.

Reiter-Niesert S¹, Boers M², Detert J³.
Author information

Abstract

BACKGROUND:

In placebo-controlled RCT of symptomatic treatment in osteoarthritis (OA) the extent of pain reduction is heterogeneous, the pooled effect size rather small. Pain reduction is typically higher in knee than in hip trials. The recommended trial duration is 3 months, but in knee OA the best treatment effect versus placebo is observed at two weeks. We hypothesized that the placebo response differs in knee vs. hip OA.

OBJECTIVE:

We performed a meta-analysis to describe the time course of pain in placebo groups of trials in knee and hip OA over three months.

METHODS:

A systematic search of PubMed, MEDLINE and Google Scholar of placebo-controlled coxib RCT (from 1999 to 2007) of hip and knee OA was performed. Pain levels (VAS, WOMAC) in the placebo groups at different measurement time points were extracted, expressed as weighted mean at weeks 2, 4, 6 to 8 and 12 to 13.

RESULTS:

21 studies included 3,064 knee OA patients and 608 hip OA patients. For knee OA, pain (VAS) decreased from 15 mm at week 2, to 20 mm at week 6-8, and 21 mm at week 12-13. For hip OA patients, pain decreased by 12 mm, 14 mm and 14 mm, respectively.

CONCLUSION:

Pain decreased in both knee and hip OA patients treated with placebo at 2 weeks, but further decreases up to week 12 occurred only in knee OA, especially for pain VAS, resulting in a time dependent impact on the magnitude of treatment outcome. Primary endpoint pain should be assessed at 2 to 4 weeks.

KEYWORDS: Study design; course of pain intensity; osteoarthritis of the hip; osteoarthritis of the knee; placebo
PMID:26774732

39 B. SHOES**Shoe stiffening orthotics in OA**

Am J Phys Med Rehabil. 2016 Feb;95(2):103-11. doi: 10.1097/PHM.0000000000000350.

Effectiveness of Shoe Stiffening Inserts for First Metatarsophalangeal Joint Osteoarthritis: A Proof-of-Concept Study.

Jerilyn TX¹, Menz HB, Murley GS, Munteanu SE.
Author information

Abstract

OBJECTIVE:

The objective of this study was to determine the feasibility of shoe stiffening inserts to reduce pain in first metatarsophalangeal joint osteoarthritis.

DESIGN:

Thirty-one participants with first metatarsophalangeal joint osteoarthritis were prescribed shoe stiffening inserts and were evaluated at baseline and at 1 and 3 mos. The primary outcome measure was foot pain, assessed using the foot pain domain of the Foot Health Status Questionnaire (possible score ranges from 0 to 100). Secondary outcome measures included foot-related disability (foot function domain of the Foot Health Status Questionnaire), self-reported treatment effectiveness, use of rescue medication and other co-interventions, and adverse events.

RESULTS:

At 1 and 3 mos, statistically significant improvements in foot pain and foot-related disability were observed (mean difference at 3 mos: foot pain = 18.8, 95% confidence interval, 13.3-24.3; foot function = 11.8, 95% confidence interval, 4.3-17.3). Treatment was reported to be effective by 78% of participants. Few participants (4%) reported using pain-relieving medication. Minor adverse events were reported by 30% of participants.

CONCLUSIONS:

Full-length shoe stiffening inserts may be an effective intervention in first metatarsophalangeal joint osteoarthritis. However, further controlled studies are required.

PMID:26135375

40. ANKLE SPRAINS AND INSTABILITY**Wobble board**

Clin J Sport Med. 2016 Jan;26(1):76-82. doi: 10.1097/JSM.0000000000000191.

Wobble Board Rehabilitation for Improving Balance in Ankles With Chronic Instability.

Linens SW¹, Ross SE, Arnold BL.
Author information

Abstract

OBJECTIVE:

To quantify improvements in clinical impairments using a wobble board rehabilitation protocol for chronic ankle instability (CAI).

DESIGN:

Prospective randomized controlled trial.

SETTING:

Laboratory.

PATIENTS:

Thirty-four participants with "giving way" and history of ankle sprains were randomly assigned to a rehabilitation group (REH) (170.22 ± 8.71 cm; 75.57 ± 13.55 kg; 22.94 ± 2.77 years) or control group (CON) (168.57 ± 9.81 cm; 77.19 ± 19.93 kg; 23.18 ± 3.64 years).

INTERVENTIONS:

Four weeks with no intervention for CON or wobble board rehabilitation for REH, consisting of 3 sessions per week of 5 repetitions.

MAIN OUTCOME MEASURES:

Dependent variables were preintervention and postintervention score on foot lift test (average number of errors), Time-in-Balance Test (TBT) (longest time), Star Excursion Balance Test (SEBT)-anteromedial, medial, and posteromedial (average reach distance normalized to leg length), side hop test (fastest time), and figure-of-eight hop test (fastest time).

RESULTS:

Main effects for time were significant for all measures ($P < 0.05$); but main effects for groups were not ($P > 0.05$) except for SEBT-anteromedial reach direction. Significant interactions were found for all dependent measures ($P < 0.05$) except for TBT ($P > 0.05$). Post hoc testing of significant interactions showed REH improved performance at posttest, whereas CON did not.

CONCLUSIONS:

These findings demonstrate that a single intervention using a wobble board improved static and dynamic balance deficits associated with CAI.

CLINICAL RELEVANCE:

This approach provides a potentially more economical, time efficient, and space efficient means of improving clinical outcome measures associated with CAI in patients who are physically active.

PMID:25831410

Exercises for

Med Sci Sports Exerc. 2015 Dec 30.

Sensory-Targeted Ankle Rehabilitation Strategies for Chronic Ankle Instability.

McKeon PO¹, Wikstrom EA.

Author information

Abstract

INTRODUCTION:

Deficient sensory input from damaged ankle ligament receptors is thought to contribute to sensorimotor deficits in those with chronic ankle instability (CAI). Targeting other viable sensory receptors may then enhance sensorimotor control in these patients. The purpose of this randomized controlled trial was to evaluate the effects of 2 weeks of sensory-targeted rehabilitation strategies (STARS) on patient- and clinician-oriented outcomes in those with CAI.

METHODS:

Eighty patients with self-reported CAI participated. All patients completed patient-oriented questionnaires capturing self-reported function as well as the weight-bearing lunge test (WBLT) and an eyes closed single limb balance test. After baseline testing, patients were randomly allocated to four STARS groups: joint mobilization (JM), plantar massage (PM), triceps surae stretching (TS), or control (CON). Each patient in the intervention groups received six, five-minute treatments of their respective STARS over two weeks. All subjects were reassessed on patient and clinician oriented measures immediately following the intervention and completed a one-month follow up that consisted of patient-oriented measures. Change scores of the three STARS groups were compared to the CON using independent t-tests and Hedge's g effect sizes (ES) with 95% confidence intervals (CI).

RESULTS:

The JM group had the greatest WBLT improvement. PM had the most meaningful single limb balance improvement. All STARS groups improved patient-oriented outcomes with JM having the most meaningful effect immediately after the intervention and PM at the one-month follow up.

CONCLUSION:

Each STARS treatment offers unique contributions to the patient and clinician oriented rehabilitation outcomes of those with CAI. Both JM and PM appear to demonstrate the greatest potential to improve sensorimotor function in those with CAI.

PMID: 26717498

41 A. ACHILLES TENDON AND CALF**Heel lift**

J Orthop Sports Phys Ther. 2016 Jan 11:1-32.

The Effect of an In-Shoe Orthotic Heel Lift on Loading of the Achilles Tendon During Shod Walking.

Wulf M^{1,2}, Wearing SC^{2,3}, Hooper SL⁴, Bartold S⁵, Reed L², Brauner T¹.
Author information

Abstract

Study Design Controlled laboratory study. Background Orthotic heel lifts are thought to lower tension in the Achilles tendon but evidence for this effect is equivocal.

Objective To investigate the effect of a 12-mm in-shoe orthotic heel lift on Achilles tendon loading during shod walking using transmission-mode ultrasonography.

Methods The propagation speed of ultrasound, which is governed by the elastic modulus and density of tendon and is proportional to the tensile load to which it is exposed, was measured in the right Achilles tendon of twelve recreationally-active males during shod treadmill walking at matched speeds (3.4±0.7 km/h), with and without addition of a heel lift. Vertical ground reaction force and spatiotemporal gait parameters were simultaneously recorded. Data were acquired at 100Hz during 10s of steady-state walking. Statistical comparisons were made using paired t-tests ($\alpha=.05$).

Results Ultrasound transmission speed in the Achilles tendon was characterized by two maxima (P1, P2) and minima (M1, M2) during walking. Addition of a heel lift to footwear resulted in a 2% increase and 2% decrease in the first vertical ground reaction force peak and the local minimum, respectively ($P<.05$). Peak ultrasonic velocity in the Achilles tendon (P1, P2, M2) was significantly lower with addition of an orthotic heel lift ($P<.05$).

Conclusions Peak ultrasound transmission speed in the Achilles tendon was lower with the addition of a 12-mm orthotic heel lift, indicating the heel lift reduced tensile load in the Achilles tendon, thereby counteracting the effect of footwear. These findings support the addition of orthotic heel lifts to footwear in the rehabilitation of Achilles tendon disorders where management aims to lower tension within the tendon. Level of Evidence Therapy, level 2a. J Orthop Sports Phys Ther, Epub 11 Jan 2016. doi:10.2519/jospt.2016.6030.

KEYWORDS: footwear; orthoses; quantitative ultrasound; soft tissue; speed of sound
PMID: 26755409

43. HALLUX VALGUS

Contributions to

A radiographic analysis of the contribution of hallux valgus interphalangeus to the total valgus deformity of the hallux

Andrew Strydom Nikiforos Pandelis Saragas Paulo Norberto Faria Ferrao

Highlights

- •Hallux valgus interphalangeus (HVI) deformity is described as rare and largely neglected.
- •A radiographic analysis of 285 pre-operative foot X-rays was conducted.
- •We found a significant difference in the proportion of abnormal IPA in the Caucasian population.
- •HVI contributes 37.9% of the total valgus deformity of the hallux (TVDH).
- •HVI is a common entity.
- •HVI and its surgical correction must be incorporated in management algorithms.

Abstract

Background

The hallux valgus interphalangeus (HVI) deformity is described as rare, but improved outcomes in hallux valgus (HV) surgery is associated with its surgical correction via an Akin osteotomy. The hypothesis of this study is that HVI is common and makes a significant contribution to the total valgus deformity of the hallux (TVDH).

Methods

285 pre-operative foot radiographs (193 with HV, 92 non-HV), utilising standardised radiographic and measurement techniques, were analysed retrospectively. The hallux valgus angle (HVA), intermetatarsal angle (IMA), interphalangeal angle (IPA) and distal metatarsal articular angle (DMAA) were measured. The TVDH was calculated as the sum of the HVA and IPA.

Results

163 (57.2%) of the study population were Caucasian, 119 (41.8%) African and 3 Indian (1.0%). 236 (82.8%) of the population was female. There was a statistically significant difference in the proportion of abnormal IPA in the Caucasian population 112 (68.7%) compared to the proportion of abnormal IPA in the African population 64 (53.8%), $p = 0.01$.

The average contribution of the IPA to the TVDH across the whole study population was a mean (SD) of 37.9% (21.2). The average contribution of IPA to TVDH was greater in feet without HV (58.0%) when compared to feet with HV (28.3%). HVI is common, particularly in Caucasians ($p = 0.01$) and makes a significant contribution to the TVDH ($p < 0.01$). The contribution to the TVDH is more significant in mild HV.

There is an inverse relationship between the IPA and other angular measurements in the foot.

Conclusion

HVI is a common entity. The significant contribution of the IPA to the TVDH dictates that HVI must be incorporated in management algorithms. The TVDH should replace the isolated concepts of HV and HVI.

45 B. MANUAL THERAPY CERVICAL**TMJ manual therapy**

February 2016 Volume 21, Pages 10–17

Efficacy of musculoskeletal manual approach in the treatment of temporomandibular joint disorder: A systematic review with meta-analysis

Wagner Rodrigues Martins Juscelino Castro Blasczyk¹ Micaele Aparecida Furlan de Oliveira² Karina Ferreira Lagôa Gonçalves³ Ana Clara Bonini-Rocha⁴ Pierre-Michel Dugailly Ricardo Jacó de Oliveira⁵

Highlights

- Musculoskeletal manipulations approaches are effective for the treatment of TMJ.
- There is a larger effect for MMA compared to other conservative treatments.
- MMA have biomechanical and neurophysiological effects for the treatment of TMJ.

Abstract**Background**

Temporomandibular joint disorder (TMD) requires a complex diagnostic and therapeutic approach, which usually involves a multidisciplinary management. Among these treatments, musculoskeletal manual techniques are used to improve health and healing.

Objectives

To assess the effectiveness of musculoskeletal manual approach in temporomandibular joint disorder patients.

Design

A systematic review with meta-analysis.

Methods

During August 2014 a systematic review of relevant databases (PubMed, The Cochrane Library, PEDro and ISI web of knowledge) was performed to identify controlled clinical trials without date restriction and restricted to the English language. Clinical outcomes were pain and range of motion focalized in temporomandibular joint. The mean difference (MD) or standard mean difference (SMD) with 95% confidence intervals (CIs) and overall effect size were calculated at every post treatment. The PEDro scale was used to demonstrate the quality of the included studies.

Results/findings

From the 308 articles identified by the search strategy, 8 articles met the inclusion criteria. The meta-analysis showed a significant difference ($p < 0.0001$) and large effect on active mouth opening (SMD, 0.83; 95% CI, 0.42 to 1.25) and on pain during active mouth opening (MD, 1.69; 95% CI, 1.09 to 2.30) in favor of musculoskeletal manual techniques when compared to other conservative treatments for TMD.

Conclusions

Musculoskeletal manual approaches are effective for treating TMD. In the short term, there is a larger effect regarding the latter when compared to other conservative treatments for TMD.

Manipulation and neck pain

Musculoskeletal Care. 2016 Jan 12. doi: 10.1002/msc.1132.

Scapulothoracic Muscle Strength Changes Following a Single Session of Manual Therapy and an Exercise Programme in Subjects with Neck Pain.

Petersen S¹, Domino N¹, Postma C¹, Wells C¹, Cook C².

Author information

Abstract

INTRODUCTION:

Scapulothoracic muscle weakness has been associated with neck pain (NP). Little evidence exists regarding lower trapezius (LT), middle trapezius (MT) and serratus anterior (SA) strength in this population. LT strength changes have been observed following thoracic manipulation in healthy subjects. The purpose of the present study was to examine scapulothoracic strength changes following cervical manipulation in subjects with NP.

METHODS:

Twenty-two subjects with NP and 17 asymptomatic control (AC) subjects underwent strength testing of the LT, MT and SA using a hand-held dynamometer. Subjects with NP were treated with passive intervertebral neck manipulation and neck range of motion exercises. The AC group received no intervention. Strength testing was repeated after manipulation, then 48 and 96 hours later. Change scores were calculated for strength over time. Paired t-tests were done for strength change between painful and non-painful sides in the NP group. Independent t-tests were done for strength change between the NP group and AC group.

RESULTS:

There was no significant difference between groups for age, gender, hand dominance or body mass index. Mean (standard deviation) symptom duration for subjects in the NP group was 43.27 (62.71) months. There was no significant difference in strength change over time between painful and non-painful sides in the NP group for any muscle; however, there was a significant difference in strength change over time between those in the NP group and AC group for the LT ($p < 0.01$), SA ($p < 0.01$) and MT ($p < 0.01$).

DISCUSSION:

Scapulothoracic muscle strength improvements were observed in both extremities following passive intervertebral neck manipulation and neck range of motion exercises. Improvements lasted up to 96 hours following manipulation, even though no strengthening exercises were prescribed.

CONCLUSIONS:

Manipulation and range of motion should be considered as a component of intervention programmes for patients with NP and scapulothoracic muscle weakness. Future studies should compare manipulation alone to exercise alone to determine impact on strength.

KEYWORDS: Axioscapular; manipulation; mobilization; scapula; serratus anterior; trapezius
PMID: 26756540

45 C. MANUAL THERAPY THORACIC

Cervical and thoracic manipulations and pain pressure thresholds

February 2016 Volume 21, Pages 227–232

Cervical & thoracic manipulations: Acute effects upon pain pressure threshold and self-reported pain in experimentally induced shoulder pain

Craig A. Wassinger Dustin Rich Nicholas Cameron Shelley Clark Scott Davenport Maranda Lingelbach Albert Smith G. David Baxter Joshua Davidson

Highlights

- We examined the effect cervical and thoracic manipulations on experimental shoulder pain.
- An external rotation eccentric exercise protocol caused mild shoulder pain.
- Self-reported shoulder pain was reduced immediately following manipulations.
- Pain pressure threshold over infraspinatus increased bilaterally after manipulations.

Abstract

Background

Emerging evidence suggests that cervical and thoracic joint manipulations may be advocated in treating patients with shoulder pain.

Objectives

To determine the acute effects of cervical, cervicothoracic, and thoracic joint manipulations on outcomes of self-reported pain and pain pressure threshold in experimentally induced shoulder pain.

Design

Repeated measures.

Methods Twenty (20) healthy volunteers were tested on two sessions. Session 1 consisted on baseline assessment of pain pressure threshold testing over the infraspinatus bilaterally and self-reported shoulder pain using the shoulder pain and disability index (SPADI) pain scale. An isokinetic exercise protocol was used to induce delayed onset muscle soreness. In session 2 (24–48 h later), all variables were reassessed before and immediately after a combination of cervical, cervicothoracic and thoracic manipulations.

Results SPADI pain scale scores were significantly different between time points ($p < 0.001$): the exercise protocol significantly increased reported pain [mean increase 14.1, $p < 0.001$] while the manipulation significantly decreased reported pain (mean decrease 5.60, $p < 0.001$) although pain remained higher than baseline levels. Pain pressure threshold differences were also found between time points ($p = 0.001$): manipulation significantly increased pain threshold bilaterally ($p < 0.001$) similar to baseline levels.

Conclusions Cervical, cervicothoracic, and thoracic joint manipulations acutely increased pain pressure threshold and decreased self-reported shoulder pain in participants with experimentally induced shoulder pain. Physiotherapists may consider the combination of such techniques to achieve short-term hypoalgesic effects and facilitate the application of more active interventions.

Keywords: Experimental shoulder pain, Cervical and thoracic manipulation, Manual therapy

45 D. MANUAL THERAPY EXTREMITIES

Knee OA

J Orthop Sports Phys Ther. 2016 Jan 1:1-30.

Joint Mobilization Enhances Mechanisms of Conditioned Pain Modulation in Individuals With Osteoarthritis of the Knee.

Courtney CA¹, Steffen AD¹, Fernández-de-Las-Peñas C^{2,3}, Kim J⁴, Chmell SJ¹.

Author information

Abstract

Study Design Experimental laboratory study with repeated measures crossover design.

Background Treatment effects of joint mobilization may occur in part by decreasing excitability of central nociceptive pathways. Impaired conditioned pain modulation (CPM) has been found experimentally in persons with knee and hip osteoarthritis (OA), indicating impaired inhibition of central nociceptive pathways. We hypothesized increased effectiveness of CPM following application of joint mobilization, determined via measures of deep tissue hyperalgesia.

Objectives To examine the effect of joint mobilization on impaired CPM. Methods Examination of 40 individuals with moderate/severe knee OA identified 29 (73%) with impaired CPM. Subjects were randomized to receive 6 minutes of knee joint mobilization (intervention) or light manual cutaneous input only, one week apart. Deep tissue hyperalgesia was examined via pressure pain thresholds (PPT) bilaterally at knee medial joint line and the hand, at baseline, post-intervention and post-CPM testing. Further, vibration perception threshold (VPT) was measured at medial knee epicondyle at baseline and post-CPM testing.

Results Joint mobilization, but not cutaneous input intervention, resulted in a global increase in PPT, indicated by diminished hyperalgesic responses to pressure stimulus. Further, CPM was significantly enhanced following joint mobilization. Diminished baseline VPT acuity was

enhanced following joint mobilization at the knee that received intervention, but not the contralateral knee. Resting pain was also significantly lower following the joint intervention.

Conclusion CPM was enhanced following joint mobilization, demonstrated by global decrease in deep tissue pressure sensitivity. Joint mobilization may act via enhancement of descending pain mechanisms, in patients with painful knee OA. Level of Evidence 2B. *J Orthop Sports Phys Ther*, Epub 1 Jan 2016. doi:10.2519/jospt.2016.6259.

KEYWORDS: arthralgia; diffuse noxious inhibitory control; manual therapy; physical therapy techniques

PMID: 26721229

46 A. UPPER LIMB NEUROMOBILIZATION

Brachial plexus injury

February 2016 Volume 44, Pages 238–244

Relationship between maximum isometric joint moment and functional task performance in patients with brachial plexus injury: A pilot study

Dustin L. Crouch Anthony C. Santago II Johannes F. Plate Zhongyu Li Katherine R. Saul

Highlights

- •Adults with brachial plexus injury were significantly weaker on the impaired side.
- •Four of six subjects could perform all 7 tested tasks despite significant weakness.
- •Bilateral joint angles and moments only differed when touching the back of the head.
- •Subjects used a higher percentage of their maximal strength in their impaired limbs to complete tasks.
- •Only the two subjects with no measurable strength in at least one direction of movement could not perform all tested tasks.

Abstract

We evaluated whether subjects with brachial plexus injury (BPI) adapted their movements to reduce the mechanical demand on their impaired upper extremity. In 6 subjects with unilateral BPI with C5 and C6 involvement, we measured bilateral maximum isometric shoulder and elbow strength, and computed joint kinematics and net muscle-generated joint moments during 7 unimanual functional tasks. Compared to the unimpaired extremity, maximum strength in shoulder abduction, extension, and external rotation was 60% ($p = 0.02$), 49% ($p = 0.02$), and 75% ($p = 0.02$) lower, respectively, on the impaired side. Significant kinematic and kinetic differences were observed only when reaching to the back of the head. However, because of substantially reduced strength in their impaired upper extremities, subjects used a significantly higher percentage of their maximum strength during several tasks and along several directions of

movement. The peak percentage of maximal strength subjects used across tasks was 32% ($p = 0.03$) and 29% ($p = 0.03$) more on their impaired side in shoulder extension and external rotation, respectively. Subjects had less reserve strength available for performing upper extremity tasks and, therefore, may be less adaptive to strength declines due to injury progression and normal aging. Quantitatively measuring maximal strength may help clinicians ensure that patients maintain sufficient upper extremity strength to preserve long-term functional ability.

Keywords: Nerve, Shoulder, Simulation, Strength, Kinematics

48 A. STM

Neck stretching after thyroidectomy

Clin J Sport Med. 2016 Jan;26(1):76-82. doi: 10.1097/JSM.0000000000000191.

Wobble Board Rehabilitation for Improving Balance in Ankles With Chronic Instability.

Linens SW¹, Ross SE, Arnold BL.

Author information

Abstract

OBJECTIVE:

To quantify improvements in clinical impairments using a wobble board rehabilitation protocol for chronic ankle instability (CAI).

DESIGN:

Prospective randomized controlled trial.

SETTING:

Laboratory.

PATIENTS:

Thirty-four participants with "giving way" and history of ankle sprains were randomly assigned to a rehabilitation group (REH) (170.22 ± 8.71 cm; 75.57 ± 13.55 kg; 22.94 ± 2.77 years) or control group (CON) (168.57 ± 9.81 cm; 77.19 ± 19.93 kg; 23.18 ± 3.64 years).

INTERVENTIONS:

Four weeks with no intervention for CON or wobble board rehabilitation for REH, consisting of 3 sessions per week of 5 repetitions.

MAIN OUTCOME MEASURES:

Dependent variables were preintervention and postintervention score on foot lift test (average number of errors), Time-in-Balance Test (TBT) (longest time), Star Excursion Balance Test (SEBT)-anteromedial, medial, and posteromedial (average reach distance normalized to leg length), side hop test (fastest time), and figure-of-eight hop test (fastest time).

RESULTS:

Main effects for time were significant for all measures ($P < 0.05$); but main effects for groups were not ($P > 0.05$) except for SEBT-anteromedial reach direction. Significant interactions were found for all dependent measures ($P < 0.05$) except for TBT ($P > 0.05$). Post hoc testing of significant interactions showed REH improved performance at posttest, whereas CON did not.

CONCLUSIONS:

These findings demonstrate that a single intervention using a wobble board improved static and dynamic balance deficits associated with CAI.

CLINICAL RELEVANCE:

This approach provides a potentially more economical, time efficient, and space efficient means of improving clinical outcome measures associated with CAI in patients who are physically active.

PMID:25831410

STM injuries and management

February 2016 Volume 21, Pages 18–34

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 Jessica J. Wong Hainan Yu Sharanya Varatharajan Danielle Southerst Kristi A. Randhawa Deborah A. Sutton Maja Stupar Margareta C. Nordin Silvano A. Mior Gabrielle M. van der Velde Anne L. Taylor-Vaisey

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 9869 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

Breast massage

J Hum Lact. 2016 Feb;32(1):123-31. doi: 10.1177/0890334415619439. Epub 2015 Dec 7.

Therapeutic Breast Massage in Lactation for the Management of Engorgement, Plugged Ducts, and Mastitis.

Witt AM¹, Bolman M², Kredit S³, Vanic A².

Author information

Abstract

BACKGROUND:

Many women in developed countries do not meet their breastfeeding goals and wean early because of breast pain.

OBJECTIVE:

This study aimed to describe clinical response to therapeutic breast massage in lactation (TBML) in the management of engorgement, plugged ducts, and mastitis.

METHODS:

Breastfeeding women presenting with engorgement, plugged ducts, or mastitis who received TBML as part of their treatment were enrolled (n = 42). Data collected at the initial visit included demographic, history, and exam data pre-TBML and post-TBML. Email surveys sent 2 days, 2 weeks, and 12 weeks following the initial visit assessed pain and breastfeeding complications. A nested case control of engorged mothers (n = 73) was separately enrolled to compare engorgement severity.

RESULTS:

Reasons for the visit included engorgement (36%), plugged ducts (67%), and mastitis (29%). Cases, compared to controls, were significantly more likely to have severe engorgement (47% vs 7%, P < .001). Initial mean breast pain level among those receiving TBML was 6.4 out of 10. Following TBML, there was significant improvement in both breast (6.4 vs 2.8, P < .001) and nipple pain (4.6 vs 2.8, P = .013). All women reported immediate improvement in their pain level. At the 12-week survey, 65% found the massage treatment very helpful. The majority of the women with a new episode of mastitis or plugged duct during the study follow-up found the techniques learned during the office visit very helpful for home management of these episodes.

CONCLUSION:

In office, TBML is helpful for the reduction of acute breast pain associated with milk stasis. Mothers find TBML helpful both immediately in-office and for home management of future episodes.

KEYWORDS: blocked ducts; breast engorgement; breast pain; breastfeeding; breastfeeding experience; breastfeeding practices; breastfeeding support; expression; mastitis
 PMID: 26644422

48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE

TP review

Clinical Review Section A Critical Overview of the Current Myofascial Pain Literature – January 2016

Jan Dommerholt, PT, DPT, DAAPM Michelle Finnegan, PT, DPT, OCS, FAAOMPT
 Rob Grieve, PT, Ph.D Todd Hooks, PT, ATC, OCS, SCS, FAAOMPT

Summary

Reflecting on the past year, the number of publications on myofascial pain continues to increase in a steady rate. The current review includes 30 basic and clinical studies, case reports, reviews, and reports from fifteen different countries about trigger points (TrP), myofascial pain (MP), dry needling (DN) and other related interventions. We are pleased that during 2015 this article made the top 15 of most downloaded articles as many as three times! In general, the quality of published papers is improving as well. Nevertheless, several papers included in this overview, mention the application of “ischemic compression”, which is a questionable concept in the

context of TrP inactivation. As we have outlined previously, in the current thinking about myofascial pain, TrPs feature significant hypoxia and a lowered pH (Ballyns et al 2011 , Shah and Gilliams 2008), and attempts to induce more ischemia would be counterproductive. Already in 1999, Simons, Travell and Simons changed the terminology from ischemic compression to TrP compression (Simons et al 1999) and we recommend that contemporary researchers and clinicians adopt the new terminology and stop using the term “ischemic compression.”

Keywords: Myofascial pain syndrome, Trigger points, Dry needling, Manual therapy, Reviews

49. STRETCHING

Stretching for the patella position

Man Ther. 2015 Dec 22. pii: S1356-689X(15)00255-6. doi: 10.1016/j.math.2015.12.005.

Effects of static stretching of knee musculature on patellar alignment and knee functional disability in male patients diagnosed with knee extension syndrome: A single-group, pretest-posttest trial.

Pourahmadi MR¹, Ebrahimi Takamjani I², Hesampour K³, Shah-Hosseini GR⁴, Jamshidi AA¹, Shamsi MB⁵.

Author information

Abstract

BACKGROUND:

Knee extension (Kext) syndrome is based on movement system impairments and is described as knee pain associated with quadriceps stiffness.

OBJECTIVE:

To investigate the effects of 3 times per week for 4 weeks static stretching of knee musculature on patellar alignment and knee functional disability in male Kext syndrome patients.

DESIGN:

A single-group, pretest-posttest clinical trial.

SETTING:

Hazrat-e-Rasoul Akram Hospital.

PARTICIPANTS:

Forty-six male Kext syndrome patients aged 18-35 years.

METHODS:

Knee functional disability was assessed by the Kujala questionnaire. Patellar tilt was assessed using the skyline view X-ray. In addition, patella alta was assessed by X-ray using the Insall-Salvati ratio. After intervention, changes in knee flexion-extension range of motion (ROM) and hip adduction were assessed by goniometer and inclinometer. Changes in patellar tilt and patella alta were evaluated. Correlations between muscles length, patellar tilt and knee functional disability were also evaluated.

RESULTS:

The mean of patellar tilt in male Kext syndrome patients was 15.19°. Only the correlation between rectus femoris shortness and patellar tilt ($P = 0.002$) and the correlation between rectus femoris shortness and knee functional disability ($P = 0.037$) were significant. Patella alta was not severe in male Kext syndrome patients (1.28 ± 0.10). Knee flexion-extension ROM and femoral adduction increased significantly after a 12-session stretching programme ($P < 0.0001$).

CONCLUSION:

The results demonstrated that rectus femoris shortness had higher correlation with patellar tilt and knee functional disability than iliotibial band and hamstring shortness. Stretching was effective in reducing patellar tilt, patella alta, knee functional disability, increasing knee ROM and hip adduction in these patients.

KEYWORDS: Knee extension syndrome; Knee functional disability; Patella alta; Patellar tilt

PMID: 26751693

[Hamstring stretching](#)

Physiother Theory Pract. 2016 Jan 12:1-10.

A comparison of two stretching programs for hamstring muscles: A randomized controlled assessor-blinded study.

Demoulin C^{1,2}, Wolfs S^{1,2}, Chevalier M¹, Granado C¹, Grosdent S^{1,2}, Depas Y¹, Roussel N^{3,4}, Hage R¹, Vanderthommen M^{1,2}.

Author information

Abstract

Most parameters regarding hamstring flexibility training programs have been investigated; however, the joint (i.e. hip or knee) on which the stretching should preferentially be focused needs to be further explored. This randomized controlled assessor-blinded study aimed to investigate the influence of this parameter. We randomly assigned 111 asymptomatic participants with tight hamstring muscles in three groups: a control group and two groups following a different home-based 8-week (five 10-minute sessions per week) hamstring stretching program

(i.e. stretching performed by flexing the hip while keeping the knee extended [SH] or by first flexing the hip with a flexed knee and then extending the knee [SK]). Range of motion (ROM) of hip flexion and knee extension were measured before and after the stretching program by means of the straight leg raising test and the passive knee extension angle test, respectively. Eighty-nine participants completed the study. A significant increase in ROM was observed at post-test. Analyses showed significant group-by-time interactions for changes regarding all outcomes. Whereas the increase in hip flexion and knee extension ROM was higher in the stretching groups than in the CG (especially for the SH group $p < 0.05$), no differences between the two stretching groups were observed ($p > 0.05$). In conclusion, the fact that both stretching programs resulted in similar results suggests no influence of the joint at which the stretching is focused upon, as assessed by the straight leg raising and knee extension angle tests.

KEYWORDS: Flexibility; neurodynamics; range of motion; test; training
 PMID: 26756214

51. CFS/BET

Lifting training

iLift: a health behavior change support system for lifting and transfer techniques to prevent lower-back injuries in healthcare.

International Journal of Medical Informatics, 01/18/2016 Kuipers DA, et al.

Lower back problems are a common cause of sick leave of employees in Dutch care homes and hospitals. In the Netherlands over 40% of reported sick leave is due to back problems, mainly caused by carrying out heavy work. The goal of the iLift project was to develop a game for nursing personnel to train them in lifting and transfer techniques. Data gathered in the final field test shows an in-game training effect, causing players to exhibit correct techniques for static lifting and transferring techniques but also revealed the necessity for future social system development and especially regarding intervention acceptance. Social system factors showed a strong impact on the games persuasive capacities and its autogenous intent.

Behavioral training and pain

Pain Physician. 2015 Sep-Oct;18(5):459-71.

Effect of Individually Tailored Biopsychosocial Workplace Interventions on Chronic Musculoskeletal Pain and Stress Among Laboratory Technicians: Randomized Controlled Trial.

Jay K1, Brandt M2, Hansen K2, Sundstrup E3, Jakobsen MD3, Schraefel MC4, Sjogaard G5, Andersen LL6.

BACKGROUND: Chronic musculoskeletal pain is prevalent among laboratory technicians and work-related stress may aggravate the problem.

OBJECTIVES: This study investigated the effect of a multifaceted worksite intervention on pain and stress among laboratory technicians with chronic musculoskeletal pain using individually tailored physical and cognitive elements.

STUDY DESIGN: This trial uses a single-blind randomized controlled design with allocation concealment in a 2-armed parallel group format among laboratory technicians. The trial "Implementation of physical exercise at the Workplace (IRMA09)--Laboratory technicians" was registered at ClinicalTrials.gov prior to participant enrolment.

SETTING: The study was conducted at the head division of a large private pharmaceutical company's research and development department in Denmark. The study duration was March 2014 (baseline) to July 2014 (follow-up).

METHODS: Participants (n = 112) were allocated to receive either physical, cognitive, and mindfulness group-based training (PCMT group) or a reference group (REF) for 10 weeks at the worksite. PCMT consisted of 4 major elements: 1) resistance training individually tailored to the pain affected area, 2) motor control training, 3) mindfulness, and 4) cognitive and behavioral therapy/education. Participants of the REF group were encouraged to follow ongoing company health initiatives. The predefined primary outcome measure was pain intensity (VAS scale 0-10) in average of the regions: neck, shoulder, lower and upper back, elbow, and hand at 10 week follow-up. The secondary outcome measure was stress assessed by Cohen's perceived stress questionnaire. In addition, an explorative dose-response analysis was performed on the adherence to PCMT with pain and stress, respectively, as outcome measures.

RESULTS: A significant ($P < 0.0001$) treatment by time interaction in pain intensity was observed with a between-group difference at follow-up of -1.0 (95%CI: -1.4 to -0.6). No significant effect on stress was observed (treatment by time $P = 0.16$). Exploratory analyses for each body region separately showed significant pain reductions of the neck, shoulders, upper back and lower back, as well as a tendency for hand pain. Within the PCMT group, general linear models adjusted for age, baseline pain, and stress levels showed significant associations for the change in pain with the number of physical-cognitive training sessions per week (-0.60 [95%CI -0.95 to -0.25]) and the number of mindfulness sessions (0.15 [95%CI 0.02 to 0.18]). No such associations were found with the change in stress as outcome.

LIMITATIONS: Limitations of behavioral interventions include the inability to blind participants to which intervention they receive. Self-reported outcomes are a limitation as they may be influenced by placebo effects and outcome expectations.

CONCLUSIONS: We observed significant reductions in chronic musculoskeletal pain following a 10-week individually adjusted multifaceted intervention with physical training emphasizing dynamic joint mobility and mindfulness coupled with fear-avoidance and de-catastrophizing behavioral therapy compared to a reference group encouraged to follow on-going company health initiatives. A higher dose of physical-cognitive training appears to facilitate pain reduction, whereas a higher dose of mindfulness appears to increase pain. Hence, combining physical training with mindfulness may not be an optimal strategy for pain reduction.

52. EXERCISE

Pilates

Spine (Phila Pa 1976). 2015 Dec 14.

Pilates for Low Back Pain: Complete Republication of a Cochrane Review.

Yamato TP¹, Maher CG, Saragiotto BT, Hancock MJ, Ostelo RW, Cabral CM, Costa LC, Costa LO.

Author information

Abstract

STUDY DESIGN:

Systematic review.

OBJECTIVES:

To determine the effects of the Pilates method for patients with non-specific acute, subacute or chronic low back pain.

SUMMARY OF BACKGROUND DATA:

The Pilates method is one of the most common forms of intervention based on exercise used for treating patients with low back pain. However, its effectiveness is not well established.

METHODS:

We conducted searches on CENTRAL, MEDLINE, EMBASE, CINAHL, PEDro and SPORTDiscus up to March 2014. We included randomised controlled trials examining the effectiveness of Pilates in patients with acute, subacute or chronic non-specific low back pain. The outcomes evaluated were pain, disability, function, and global impression of recovery. Two independent reviewers screened for potentially eligible studies, assessed risk of bias, and extracted the data. We evaluated the overall quality of evidence using the GRADE approach and treatment effect sizes were described using mean differences and 95% confidence intervals.

RESULTS:

Searches retrieved 126 trials, of which 10 were included in the review (n=510 participants). Seven studies were considered to have low risk of bias, and three were considered at high risk of bias. When compared to minimal intervention, Pilates reduces pain at short and intermediate term with low to moderate quality evidence and medium effect sizes. For disability, there is also a significant difference in favour to Pilates with low to moderate quality evidence and small effect size for short term and medium effect size for intermediate term compared with minimal intervention. It is unclear whether Pilates is better than other exercises for short-term pain, but there is low quality evidence that Pilates reduces pain at intermediate term. For disability, there is moderate quality evidence that there is no significant difference between Pilates and other exercise, either in the short term, or in the intermediate term.

CONCLUSION:

There is low to moderate quality evidence that Pilates is more effective than minimal intervention with most of the effect sizes being considered medium. However, there is no conclusive evidence that Pilates is superior to other forms of exercise.

LEVEL OF EVIDENCE: 1.

PMID: 26679894

53. CORE

Stabilization ex and proprioception

BMC Musculoskelet Disord. 2016 Jan 14;17(1):23. doi: 10.1186/s12891-016-0875-4.

The effects of an 8-week stabilization exercise program on lumbar movement sense in patients with low back pain.

Boucher JA^{1,2,3}, Preuss R^{4,5}, Henry SM⁶, Dumas JP⁷, Larivière C^{8,5}.

Author information

Abstract

BACKGROUND:

Lumbar stabilization exercises have gained popularity and credibility in patients with non-acute low back pain. Previous research provides more support to strength/resistance and coordination/stabilisation programs. Some authors also suggest adding strength/resistance training following motor control exercises. However, the effect of such a lumbar stabilization program on lumbar proprioception has never been tested so far. The present study investigated the effects of an 8-week stabilization exercise program on lumbar proprioception in patients with low back pain (LBP) and assessed the 8-week test-retest reliability of lumbar proprioception in control subjects.

METHODS:

Lumbar proprioception was measured before and after an 8-week lumbar stabilization exercise program for patients with LBP. Control subjects participated in the same protocol but received no treatment.

RESULTS:

The lumbar proprioception measure showed moderate reliability. Patients with LBP and control subjects demonstrated no differences in lumbar proprioception at baseline. Participants from both groups showed better proprioception following the 8-week interval, demonstrating the presence of learning between testing days.

CONCLUSIONS:

The improvement of lumbar proprioception seen in both groups was ascribed to motor learning of the test itself. The effect of lumbar stabilization exercises on lumbar proprioception remains unknown because the LBP group did not show lumbar proprioception impairments.

PMID: 26762185

56. ATHLETICS

6 min. step test valid

Clin J Sport Med. 2016 Jan;26(1):69-75. doi: 10.1097/JSM.0000000000000190.

Validity and Reliability of the 6-Minute Step Test in Healthy Individuals: A Cross-sectional Study.

Arcuri JF¹, Borghi-Silva A, Labadessa IG, Sentanin AC, Candolo C, Pires Di Lorenzo VA.
Author information

Abstract

OBJECTIVE: To determine the 6-minute step test's (6MST) reliability and validity and to establish reference performance values of this test.

DESIGN: Prospective observational cross-sectional study.

SETTING: Spirometry and Respiratory Physiotherapy Laboratory, Federal University of São Carlos (institutional).

PARTICIPANTS: Ninety-one individuals [42 men and 49 women, mean age = 39 years (SD, 17 years)] without any diagnosed diseases and with normal exercise capacity [6-minute walk test (6MWT) >75% of the predicted normal].

INDEPENDENT VARIABLES: Participants underwent two 6MST on 1 day and two 6MWT on another day in randomized order. Furthermore, age, gender, height, weight, lower limbs length, abdominal circumference, percentage of body fat, and fat-free mass were obtained.

MAIN OUTCOME MEASURES: Test-retest reliability was assessed by comparing the findings of the two 6MST using the intraclass correlation coefficient (ICC) and Bland-Altman plot. Validity was assessed by comparing outcomes of the 6MST to outcomes of 6MWT using the Pearson correlation coefficient. A multiple regression analysis was conducted using the stepwise method to develop an equation to predict reference values.

RESULTS: The performance (mean steps \pm SD) in the first and second test was 149 ± 34 and 149 ± 36 steps, respectively, which was correlated to distance (in meters) in 6MWT ($r = 0.72$; $P < 0.05$). Six-minute step test performance was reliable (ICC = 0.9; 95% confidence interval: 0.85-0.93). The equation to predict reference values for the first 6MST was significant ($P < 0.001$ and $R = 0.48$): Performance(steps) = $174 + 1.05 \times \text{Age}(\text{years})$ to women and Performance(steps) = $209 + 1.05 \times \text{Age}(\text{years})$ to men.

CONCLUSIONS: Six-minute step test is a reliable and valid test. Moreover, the number of steps may be predicted by demographic and anthropometric variables with moderate strength of prediction.

CLINICAL RELEVANCE: Six-minute step test is an exercise test that is easy to be conducted, more tolerable than a graded exercise test, requires fewer equipments and space, and permits better monitoring of the participants. The assessment of the reliability, validity, and reference values will provide a better interpretability for clinicians to use it, especially in primary care.

PMID:25706661

58. RUNNING

PF pain and altered mechanics

Altered mechanics in runners

Runners with patellofemoral pain have altered biomechanics which targeted interventions can modify: A systematic review and meta-analysis

Bradley S Neal Christian J Barton Rosa Gallie Patrick O'Halloran Dylan Morrissey

Highlights

- Increased peak hip adduction is a risk factor for PFP development in female runners.

- Significant associations were found between altered biomechanics and PFP in runners.
- Increased forces at foot level are also a risk factor for PFP development in runners.
- Running retraining and strengthening exercise improve pain in runners with PFP.
- Running retraining works via a kinematic mechanism of reducing peak hip adduction.

Abstract

Patellofemoral pain (PFP) is the most prevalent running pathology and associated with multi-level biomechanical factors. This systematic review aims to guide treatment and prevention of PFP by synthesising prospective, observational and intervention studies that measure clinical and biomechanical outcomes in symptomatic running populations. Medline, Web of Science and CINAHL were searched from inception to April 2015 for prospective, case-control or intervention studies in running-related PFP cohorts. Study methodological quality was scored by two independent raters using the modified Downs and Black or PEDro scales, with meta-analysis performed where appropriate. 28 studies were included. Very limited evidence indicates that increased peak hip adduction is a risk factor for PFP in female runners, supported by moderate evidence of a relationship between PFP and increased peak hip adduction, internal rotation and contralateral pelvic drop, as well as reduced peak hip flexion. Limited evidence was also identified that altered peak force and time to peak at foot level is a risk factor for PFP development. Limited evidence from intervention studies indicates that both running retraining and proximal strengthening exercise lead to favourable outcomes in both pain and function, but only running retraining significantly reduces peak hip adduction, suggesting a possible kinematic mechanism. Put together, these findings highlight limited but coherent evidence of altered biomechanics which interventions can alter with resultant symptom change in females with PFP. There is a clear need for high quality prospective studies of intervention efficacy with measurement of explanatory mechanisms.

Keywords: Patellofemoral Pain, Kinematics, Kinetics, Risk Factors, Running, Systematic Review

Downhill fatigue

Scand J Med Sci Sports. 2015 Nov 19. doi: 10.1111/sms.12583.

Acute and delayed peripheral and central neuromuscular alterations induced by a short and intense downhill trail run.

Giandolini M1,2, Horvais N2, Rossi J1, Millet GY3, Morin JB4, Samozino P1.

Author information

Abstract

Downhill sections are highly strenuous likely contributing to the development of neuromuscular fatigue in trail running. Our purpose was to investigate the consequences of an intense downhill

trail run (DTR) on peripheral and central neuromuscular fatigue at knee extensors (KE) and plantar flexors (PF). Twenty-three runners performed a 6.5-km DTR (1264-m altitude drop) as fast as possible. The electromyographic activity of vastus lateralis (VL) and gastrocnemius lateralis (GL) was continuously recorded. Neuromuscular functions were assessed Pre-, Post-, and 2-day Post-DTR (Post2d). Maximal voluntary torques decreased Post (~ -19% for KE, ~ -25% for PF) and Post2d (~ -9% for KE, ~ -10% for PF). Both central and peripheral dysfunctions were observed. Decreased KE and PF voluntary activation (VA), evoked forces, VL M-wave amplitude, and KE low-frequency fatigue were observed at Post. Changes in VL M-wave amplitude were negatively correlated to VL activity during DTR. Changes in PF twitch force and VA were negatively correlated to GL activity during DTR. The acute KE VA deficit was about a third of that reported after ultramarathons, although peripheral alterations were similar. The prolonged force loss seems to be mainly associated to VA deficit likely induced by the delayed inflammatory response to DTR-induced ultrastructural muscle damage.

59. PAIN

Sleep deprivation/pain/inflammation

VOLUME 39, ISSUE 01

BASIC SCIENCE

Sleep Deprivation and Recovery Sleep Prior to a Noxious Inflammatory Insult Influence Characteristics and Duration of Pain

Giancarlo Vanini, MD

Study Objectives:

Insufficient sleep and chronic pain are public health epidemics. Sleep loss worsens pain and predicts the development of chronic pain. Whether previous, acute sleep loss and recovery sleep determine pain levels and duration remains poorly understood. This study tested whether acute sleep deprivation and recovery sleep prior to formalin injection alter post-injection pain levels and duration.

Methods:

Male Sprague-Dawley rats (n = 48) underwent sleep deprivation or ad libitum sleep for 9 hours. Thereafter, rats received a subcutaneous injection of formalin or saline into a hind paw. In the recovery sleep group, rats were allowed 24 h between sleep deprivation and the injection of formalin. Mechanical and thermal nociception were assessed using the von Frey test and Hargreaves' method. Nociceptive measures were performed at 1, 3, 7, 10, 14, 17 and 21 days post-injection.

Results:

Formalin caused bilateral mechanical hypersensitivity (allodynia) that persisted for up to 21 days post-injection. Sleep deprivation significantly enhanced bilateral allodynia. There was a synergistic interaction when sleep deprivation preceded a formalin injection. Rats allowed a recovery sleep period prior to formalin injection developed allodynia only in the injected limb, with higher mechanical thresholds (less allodynia) and a shorter recovery period. There were no persistent changes in thermal nociception.

Conclusion:

The data suggest that acute sleep loss preceding an inflammatory insult enhances pain and can contribute to chronic pain. The results encourage studies in a model of surgical pain to test whether enhancing sleep reduces pain levels and duration.

Citation:

Vanini G. Sleep deprivation and recovery sleep prior to a noxious inflammatory insult influence characteristics and duration of pain. *SLEEP* 2016;39(1):133–142.

Widespread pain

Eur J Pain. 2016 Jan 15. doi: 10.1002/ejp.834.

Individual and joint effects of risk factors for onset widespread pain and obesity - a population-based prospective cohort study.

Magnusson K¹, Hagen KB^{1,2}, Natvig B³.

Author information

Abstract

BACKGROUND:

Widespread musculoskeletal pain (WSP) and obesity frequently co-occur and may have shared risk factors. We aimed to investigate whether four dichotomized risk factors individually or jointly increase the risk for the onset of WSP and onset of obesity.

METHODS:

Persons aged 34-76 years in 2004 living in Ullensaker municipality, Norway, responded to questionnaires in 2004 and 2010 (n = 1553). Using causal interaction analyses, we examined whether baseline obesity and WSP, poor sleep quality, mental distress and poor physical fitness jointly increased the risk of new onset WSP (≥ 3 pain sites leading to disability the last year) and new onset obesity (self-reported BMI ≥ 30 kg/m²) in persons without WSP (n = 1270) or without obesity (n = 1300) at baseline respectively.

RESULTS:

The mean (SD) age was 51 (12.1) years and 56% were female. The incidence of WSP and obesity were 9.1% and 5.4%. Mental distress and poor sleep quality individually and jointly with poor physical fitness increased WSP onset risk (relative excess risk due to interaction [RERI] = 1.90, 95% CI, 0.39-3.42 and RERI = 1.43, 95% CI, 0.10-2.76). Poor physical fitness individually increased the risk for new onset obesity, and baseline WSP and poor sleep quality jointly (RERI = 1.87, 95% CI, 0.49-3.24). The presence of more risk factors was dose-dependently associated with onset WSP and to a lesser extent with onset obesity.

CONCLUSION:

The onset of WSP and the onset of obesity were results of joint effects of exposures. Poor physical fitness was a key covariate in increasing the risk for both conditions. **WHAT DOES THIS STUDY ADD?:** In a general population, the new onset of widespread pain and new onset of obesity were results of joint effects of risk factors and particularly poor physical fitness. The study may aid in the identification of patients at risk of future disability.

PMID: 26773567

61. FIBROMYALGIA

FMRI changes

Eur J Pain. 2016 Jan 15. doi: 10.1002/ejp.832.

Altered fMRI resting-state connectivity in individuals with fibromyalgia on acute pain stimulation.

Ichesco E¹, Puiu T¹, Hampson JP¹, Kairys AE^{1,2}, Clauw DJ¹, Harte SE¹, Peltier SJ³, Harris RE¹, Schmidt-Wilcke T^{1,4}.

Author information

Abstract

BACKGROUND:

Fibromyalgia is a chronic widespread pain condition, with patients commonly reporting other symptoms such as sleep difficulties, memory complaints and fatigue. The use of magnetic resonance imaging (MRI) in fibromyalgia has allowed for the detection of neural abnormalities, with alterations in brain activation elicited by experimental pain and alterations in resting state connectivity related to clinical pain.

METHODS:

In this study, we sought to monitor state changes in resting brain connectivity following experimental pressure pain in fibromyalgia patients and healthy controls. Twelve fibromyalgia patients and 15 healthy controls were studied by applying discrete pressure stimuli to the thumbnail bed during MRI. Resting-state functional MRI scanning was performed before and immediately following experimental pressure pain. We investigated changes in functional connectivity to the thalamus and the insular cortex.

RESULTS:

Acute pressure pain increased insula connectivity to the anterior cingulate and the hippocampus. Additionally, we observed increased thalamic connectivity to the precuneus/posterior cingulate cortex, a known part of the default mode network, in patients but not in controls. This connectivity was correlated with changes in clinical pain.

CONCLUSIONS:

These data reporting changes in resting-state brain activity following a noxious stimulus suggest that the acute painful stimuli may contribute to the alteration of the neural signature of chronic pain. WHAT DOES THIS STUDY/ADD?: In this study acute pain application shows an echo in functional connectivity and clinical pain changes in chronic pain.

PMID: 26773435

62 A. NUTRITION/VITAMINS

Vit C and OA

Clin Rheumatol. 2016 Jan 19.

Associations between dietary antioxidants intake and radiographic knee osteoarthritis.

Li H¹, Zeng C¹, Wei J², Yang T¹, Gao SG¹, Li YS¹, Lei GH³.

Author information

Abstract

The aim of the study is to examine the cross-sectional associations between dietary antioxidants (carotenoid, vitamin C, E, and selenium) intake and radiographic knee osteoarthritis (OA). A total of 4685 participants were included in this study. Dietary intake was assessed using a validated semi-quantitative food frequency questionnaire. Radiographic knee OA was defined as Kellgren-Lawrence (K-L) grade 2 in at least one leg. A multivariable logistic analysis model was established to test the relationship between dietary antioxidants (carotenoid, vitamin C, E, and selenium) intake and radiographic knee OA with adjustment of a number of potential confounding factors. A significant positive association between dietary vitamin C intake (P value for trend was 0.04 in multivariable adjusted analysis) and radiographic knee OA was observed. The relative odds of radiographic knee OA were increased by 0.39 times in the third quintile (OR 1.39, 95 % CI 1.11-1.73), 0.42 times in the fourth quintile (OR 1.42, 95 % CI 1.13-1.79), and 0.33 times in the fifth quintile (OR 1.33, 95 % CI 1.03-1.71).

However, radiographic knee OA was not significantly associated with dietary carotenoid, vitamin E, and selenium. Among dietary antioxidants, dietary vitamin C intake was positively correlated with the prevalence of radiographic knee OA, while no significant association was found between dietary intake of carotenoid, vitamin E, and selenium and the prevalence of radiographic knee OA.

KEYWORDS: Carotenoid; Dietary antioxidants; Osteoarthritis; Selenium; Vitamin C; Vitamin E
PMID:26781781

64. ELECTROTHERAPY**Cold Laser epicondylitis**

Lasers Med Sci. 2015 Dec 29.

Long term effects of high intensity laser therapy in lateral epicondylitis patients.

Akkurt E¹, Kucuksen S², Yilmaz H³, Parlak S³, Salli A², Karaca G⁴.
Author information

Abstract

The objective of this study is to investigate short- and long-term effects of high-intensity laser therapy (HILT) in lateral epicondylitis (LE) patients. Thirty patients with LE diagnosis (23 unilateral and 7 bilateral in total 37 elbows) were treated using HILT. LE patients were evaluated before, right after, and 6 months following HILT intervention post-treatment using visual analogue scale for pain (VAS) during activity and resting. Disabilities of the Arm, Shoulder, and Hand (DASH) Score and hand grip strength test (HGST) were used. The participants of the present study were also evaluated using Short-Form 36 (SF-36) before and 6 months after the treatment. Out of the 30 patients, 8 were male and 22 female with a mean age of 47.2 ± 9.7 . The activity and resting VAS, DASH, and HGST scores revealed statistically significant improvement ($p = 0.001$) following treatment. Whereas VAS activity, DASH, and HGST scores increased after treatment until post-treatment 6 months significantly ($p = 0.001$), VAS resting scores remained stable ($p = 0.476$). A statistically significant improvement was also evident in the physical and mental components of SF-36 scores following treatment until post-treatment 6 months compared to pre-treatment scores ($p = 0.001$).

In conclusion, the results of the present study suggest that HILT is a reliable, safe, and effective treatment option in LE patients in the short and long term considering pain, functional status, and quality of life.

KEYWORDS: Elbow; High-intensity laser treatment; Lateral epicondylitis; Pain; VAS score
PMID: 26714978