

ABSTRACTS

Table of Contents

LUMBAR SPINE	Error! Bookmark not defined.
PELVIC GIRDLE	2
PELVIC ORGANS	10
VISCERA	Error! Bookmark not defined.
THORACIC SPINE	Error! Bookmark not defined.
CERVICAL SPINE	27
CRANIUM/TMJ	33
HEADACHES	34
CONCUSSIONS	Error! Bookmark not defined.
SHOULDER GIRDLE	Error! Bookmark not defined.
GLENOHUMERAL/SHOULDER	36
ELBOW	40
WRIST AND HAND	Error! Bookmark not defined.
HIP	Error! Bookmark not defined.
KNEE	Error! Bookmark not defined.
FOOT AND ANKLE	Error! Bookmark not defined.
MANUAL THERAPY/STRETCHING/MUSCLES STM	55
CFS/BET	Error! Bookmark not defined.
ATHLETICS	74
RUNNING GAIT	75
PAIN	76
COMPLEX REGIONAL PAIN	Error! Bookmark not defined.
FIBROMYALGIA	80
NUTRITION/VITAMINS/MEDICATION/TOPICALS	81
NEUROLOGICAL CONDITIONS	84

2. LBP

Graded motor imagery

Physiother Theory Pract. 2015 Oct;31(7):509-17. doi: 10.3109/09593985.2015.1060656.

Moving without moving: immediate management following lumbar spine surgery using a graded motor imagery approach: a case report.

Louw A1, Schmidt SG2, Louw C3, Puentedura EJ4.

Author information

- 1a International Spine and Pain Institute , Story City , IA , USA .
- 2b Kaiser Foundation Rehabilitation Center , Vallejo , CA , USA .
- 3c Ortho Spine and Pain Clinic , Story City , IA , USA , and.
- 4d Department of Physical Therapy , University of Nevada, Las Vegas , Las Vegas , NV , USA.

Abstract

Representational body maps are dynamically maintained in the brain and negatively influenced by neglect, decreased movement and pain. Graded motor imagery (GMI) utilizing various tactile and cognitive processes has shown efficacy in decreasing pain, disability and movement restrictions in musculoskeletal pain. Limited information is known about the cortical changes patients undergo during lumbar surgery (LS), let alone the therapeutic effect of GMI for LS. A 56-year-old patient underwent LS for low back pain, leg pain and progressive neurological deficit. Twenty-four hours prior to and 48 h after LS various psychometric, physical movement and tactile acuity measurements were recorded. Apart from predictable postoperative increases in pain, fear-avoidance, disability and movement-restrictions, pressure pain thresholds (PPT), two-point discrimination (TPD) and tactile acuity was greatly reduced. The patient underwent six physiotherapy (PT) treatments receiving a GMI program aimed at restoring the PPT, TPD and tactile acuity. The results revealed that GMI techniques applied to a patient immediately after LS caused marked improvements in movement (flexion average improvement/session 3.3 cm; straight leg raise average 8.3°/session) and an immediate hypoalgesic effect. GMI may provide PT with a non-threatening therapeutic treatment for the acute LS patient and establish a new role for PT in acute LS patients.

KEYWORDS: Brain; imagery; lumbar; mapping; pain; surgery

PMID: 26395828

Corsets and LBP - they help

Spine J. 2015 Oct 1;15(10):2222-7. doi: 10.1016/j.spinee.2015.06.047. Epub 2015 Jun 19.

A non-randomized clinical trial to assess the impact of nonrigid, inelastic corsets on spine function in low back pain participants and asymptomatic controls.

Kawchuk GN1, Edgecombe TL2, Wong AY2, Cojocaru A2, Prasad N3.

BACKGROUND CONTEXT:

Although previous studies suggest braces/corsets can reduce acute pain, no prior study has assessed back function after bracing with both self-reported and objective measures. Use of both self-reported and objective measures of spine function together may be important given evidence they assess unique aspects of function.

PURPOSE:

The aim was to assess both self-reported and objective measures of spinal function before, and after, use of a nonrigid, inelastic lumbar brace.

STUDY DESIGN/SETTING:

This was a non-randomized clinical trial.

PATIENT SAMPLE:

The sample included acute low back pain (LBP) participants and asymptomatic controls.

OUTCOME MEASURES:

Oswestry Disability Index (ODI), spinal stiffness, and muscle endurance were the outcome measures.

METHODS:

Three groups were studied: -LBP/-Brace (n=19), -LBP/+Brace (n=18), and +LBP/+Brace (n=17). Both groups of braced participants were instructed to wear the brace continually for 2 weeks with the exception of bedroom and bathroom activities. Before and after the 2-week period, three measures of spinal function were performed: spinal stiffness via motorized indentation of the L3 spinous process, a modified Sorensen test (timed lumbar extension against gravity), and the ODI. Repeated measures analyses of variance were conducted for all three outcomes.

RESULTS:

Among the groups, ODI scores decreased significantly for the +LBP/+Brace group ($p < .001$) compared with the other two groups. The +LBP/+Brace mean ODI score decreased 3.71 points (95% confidence interval [CI] 2.01-5.40) compared with the -LBP/-Brace group and decreased 3.48 points (95% CI 1.77-5.20) compared with the -LBP/+Brace group. Change scores for the Sorensen test were significantly increased in the +LBP/+Brace group ($p = .037$) compared with the -LBP/-Brace group (22.47s 95% CI 8.14-36.80). Spinal stiffness did not change significantly between groups.

CONCLUSIONS:

This study demonstrates that lumbar function assessed by self-reported and objective measures does not worsen when nonrigid, inelastic bracing is used for short periods of time for those with, or without, back pain. These data add to the existing literature that suggests short-term use of nonrigid, inelastic bracing for acute LBP does not decrease spinal function when measured separately with subjective or objective tools. **KEYWORDS:** Acute low back pain; Bracing;

Corset; Endurance; Indentation; Oswestry Disability Index; Sorensen test; Spinal stiffness
PMID:26101179

Unemployment predictors

Spine J. 2015 Sep 24. pii: S1529-9430(15)01444-8. doi: 10.1016/j.spinee.2015.09.034.

The importance of identifying and modifying unemployment predictor variables in the evolution of a novel model of care for low back pain in the general population.

Harris SA¹, Rampersaud YR².

Author information

Abstract

BACKGROUND CONTEXT:

Care for low back pain (LBP) is costly, fragmented and in non-compensation populations rarely specifically addresses factors associated with maintaining employment status or return to work (RTW).

PURPOSE:

To identify modifiable independent risk factors for 1) a negative work status at presentation and 2) a change in work status during treatment in a cohort of LBP patients. The results are intended to inform improvement in best-evidence care pathways to maximize societal outcomes and overall value of a new model of care.

STUDY DESIGN/SETTING:

Prospective observational study. Inclusion criteria; Work-eligible, non-workers compensation patients with recurrent or persistent LBP ≥ 6 weeks and ≤ 12 months. Setting; The Inter-professional Spine Assessment and Education Clinics (ISAEC) - a novel Government-funded shared-care model of management for LBP.

METHODS:

1) Cross-sectional analysis of baseline data from the initial ISAEC consultation (t_0) from December 2012 to April 2014. Work status at t_0 was dichotomized as Employed (E) or Under-Employed (UE; unemployed, modified work duty or disability). Multivariate logistic regression (MLR) modeling was used to determine independent predictors of UE status at t_0 . 2) Bivariate analysis of longitudinal data from t_0 to 6-months (t_1) to identify risk factors for work status change. Employment journey categorized into 4 groups: E_{t_0}/E_{t_1} - Employed at t_0 and Employed at t_1 ; E_{t_0}/UE_{t_1} ; UE_{t_0}/E_{t_1} ; UE_{t_0}/UE_{t_1} .

RESULTS:

1) Initial consultation data on 462 consecutive patients ($E_{t_0}=344$, $UE_{t_0}=118$). MLR identified legal claim, depression, smoking and higher STarT Back (or ODI) score as independent risk factors for UE_{t_0} . 2) Overall UE rate did not significantly change during longitudinal analysis ($n=178$, $UE_{t_0}=25.5\%$, $UE_{t_1}=22.9\%$). However, 10.5% of E_{t_0} became UE_{t_1} ($E_{t_0}/E_{t_1}=102$, $E_{t_0}/UE_{t_1}=12$). Bivariate analysis identified elevated baseline ODI score as the only significant predictor variable for UE_{t_1} in E_{t_0} cohort ($p=0.0101$). Conversely, ISAEC improved the employment status in 41% of UE_{t_0} to E_{t_1} ($UE_{t_0}/E_{t_1}=16$, $UE_{t_0}/UE_{t_1}=23$) and the absence of depression was significant for predicting RTW ($p=0.0001$).

CONCLUSIONS:

From a societal perspective employment status as an outcome measure is paramount in assessing the value of a new model of care for LBP. Mitigation strategies for the predictor variables identified will be included in ISAEC pathways in order to translate clinical improvement into societal added value.

Copyright © 2015. Published by Elsevier Inc.

KEYWORDS: depression; employment; low back pain; model of care; smoking; value

PMID: 26409414

Sleep disturbance

PLoS One. 2015 Oct 7;10(10):e0140058. doi: 10.1371/journal.pone.0140058. eCollection 2015.

Knee Pain and Low Back Pain Additively Disturb Sleep in the General Population: A Cross-Sectional Analysis of the Nagahama Study.

Murase K¹, Tabara Y², Ito H³, Kobayashi M³, Takahashi Y⁴, Setoh K², Kawaguchi T², Muro S¹, Kadotani H⁵, Kosugi S⁶, Sekine A⁷, Yamada R², Nakayama T⁴, Mishima M¹, Matsuda S³, Matsuda F², Chin K⁸.

INTRODUCTION:

Association of knee and low back pain with sleep disturbance is poorly understood. We aimed to clarify the independent and combined effects of these orthopedic symptoms on sleep in a large-scale general population.

METHODS:

Cross-sectional data about sleep and knee/low back pain were collected for 9,611 community residents (53±14 years old) by a structured questionnaire. Sleep duration less than 6 h/d was defined as short sleep. Sleep quality and the presence of knee and low back pain were evaluated by dichotomous questions. Subjects who complained about knee or low back pains were graded by tertiles of a numerical response scale (NRS) score and a Roland-Morris disability questionnaire (RDQ) score respectively. Multivariate regression analyses were performed to determine the correlates of short sleep duration and poor sleep quality.

RESULTS:

Frequency of participants who complained of the orthopedic symptoms was as follows; knee pain, 29.0%; low back pain, 42.0% and both knee and low back pain 17.6%. Both knee and low back pain were significantly and independently associated with short sleep duration (knee pain: odds ratio (OR) = 1.19, p<0.01; low back pain: OR = 1.13, p = 0.01) and poor sleep quality (knee pain: OR = 1.22, p<0.01; low back pain; OR = 1.57, p<0.01). The group in the highest tertile of the NRS or RDQ score had the highest risk for short sleep duration and poor sleep quality except for the relationship between the highest tertile of the RDQ score and short sleep duration.(the highest tertile of the NRS: OR for short sleep duration = 1.31, p<0.01; OR for poor sleep quality = 1.47, p<0.01; the highest tertile of the RDQ: OR for short sleep duration = 1.11, p = 0.12; OR for poor sleep quality = 1.81, p<0.01) Further, coincident knee and low back pain raised the odds ratios for short sleep duration (either of knee or low back pain: OR = 1.10, p = 0.06; both knee and low back pain: OR = 1.40, p<0.01) and poor sleep quality (either of knee or low back pain: OR = 1.61, p<0.01; both knee and low back pain: OR = 2.17, p<0.01).

CONCLUSION:

Knee and low back pains were independently associated with short sleep duration and poor sleep quality. Further, they additively increased the correlation with these sleep problems in the general population.

PMID: 26444713

Brain changes in cLBP

Semin Arthritis Rheum. 2015 Oct;45(2):229-37. doi: 10.1016/j.semarthrit.2015.05.002. Epub 2015 May 16.

Structural and functional brain abnormalities in chronic low back pain: A systematic review(★).

Kregel J¹, Meeus M², Malfliet A¹, Dolphens M³, Danneels L³, Nijs J⁴, Cagnie B⁵.

Abstract

OBJECTIVES:

The purpose of this systematic review is to analyze the available literature on structural and functional brain abnormalities in chronic low back pain (CLBP) using several brain magnetic resonance imaging (MRI) techniques.

METHODS:

PubMed and Web of Science were systematically screened for relevant literature using different combinations of keywords regarding structural and functional brain imaging techniques in patients with CLBP. Reference lists of included articles were hand-searched for additional literature. Eligible articles were assessed on risk of bias and reviewed by two independent researchers.

RESULTS:

The search query returned 27 articles meeting the inclusion criteria. Methodological quality varied from poor to good. A total of 10 studies evaluated structural gray matter changes. There is conflicting evidence in global gray matter changes, with both increases and decreases shown in different studies. Gray matter changes were demonstrated in specific brain regions. Structural white matter changes were reported in five studies. There is conflicting evidence in total white matter volume due to both increases and unchanged white matter. Several regional differences were identified in which white matter changes were shown. Functional organization during rest was evaluated in 10 studies. CLBP patients showed increased activation in specific regions, together with a disrupted default mode network. A total of six studies evaluated brain activity in response to a nociceptive stimulus. Findings suggest that patients demonstrated increased activity in pain-related regions, and decreased activity in analgesic regions.

CONCLUSIONS:

Overall, there is moderate evidence for regional changes in gray and white matter, together with an altered functional connectivity during rest and increased activity in pain-related areas following painful stimulation, evidencing an upregulated pain matrix. More longitudinal research is needed to clarify the temporal relationship regarding pain and neuroplastic changes, and integration of different brain imaging techniques is warranted.

Copyright © 2015 Elsevier Inc. All rights reserved.

KEYWORDS: (rs)-fMRI; Back pain; Brain activity; Chronic pain; Diffusion tensor imaging; Functional connectivity; Gray matter; Pain matrix; White matter

PMID: 2609232

PT's with LBP treat LBP

Physiother Theory Pract. 2015 Oct 9:1-6.

A clinical contrast: physical therapists with low back pain treating patients with low back pain.

Louw A¹, Puentedura EJ², Zimney K³.

Abstract

Patients with low back pain (LBP) often display faulty beliefs and cognitions regarding their pain experience. Pain neuroscience education (PNE) aims to alter the pain experience by targeting these faulty beliefs and cognitions. One PNE strategy aims specifically to reframe commonly held beliefs about tissues by patients with LBP as the single source of pain. In line with this reasoning, it is hypothesized that physical therapists (PT) treating patients with LBP may indeed experience similar, if not worse, pain experiences while treating a patient with LBP. To date, this assumption has never been studied. A PT LBP questionnaire was developed, validated and distributed to a convenience sample of attendees of an international PT conference. One-hundred and ten PTs completed the questionnaire for a 71% response rate. Ninety percent of the PTs reported having experienced LBP, with 27% at the conference experiencing LBP at the time. Of the PTs that have experienced LBP 75% reported not having received any imaging; 81% no formal diagnoses, 58% no treatment and 86% not having missed work due to LBP. Eighty-six percent of therapists reported having experienced LBP while treating a patient with LBP, with 50% convinced their LBP was higher than the LBP experienced by the patient they were treating.

The results from this study indicate PTs often treat patients with LBP while suffering LBP. It is suggested that this knowledge may potentially help patients with LBP reconceptualize their LBP experience leading to expedited recovery.

KEYWORDS: *Education; low back pain; neuroscience; physical therapy*

PMID: 26451623

PT reduces LBP costs

J Eval Clin Pract. 2015 Sep 29. doi: 10.1111/jep.12464. [Epub ahead of print]

Importance of the type of provider seen to begin health care for a new episode low back pain: associations with future utilization and costs.

Fritz JM^{1,2}, Kim J³, Dorius J⁴.

- ¹Department of Physical Therapy, College of Health, University of Utah, Salt Lake City, UT, USA.
- ²College of Health, University of Utah, Salt Lake City, UT, USA.
- ³Department of Family and Preventive Medicine, University of Utah, Salt Lake City, UT, USA.
- ⁴University of Utah Health Plans, Salt Lake City, UT, USA.

RATIONALE, AIMS AND OBJECTIVE:

Low back pain (LBP) care can involve many providers. The provider chosen for entry into care may predict future health care utilization and costs. The objective of this study was to explore associations between entry settings and future LBP-related utilization and costs.

METHODS:

A retrospective review of claims data identified new entries into health care for LBP. We examined the year after entry to identify utilization outcomes (imaging, surgeon or emergency visits, injections, surgery) and total LBP-related costs. Multivariate models with inverse probability weighting on propensity scores were used to evaluate relationships between utilization and cost outcomes with entry setting.

RESULTS:

747 patients were identified (mean age = 38.2 (\pm 10.7) years, 61.2% female). Entry setting was primary care (n = 409, 54.8%), chiropractic (n = 207, 27.7%), physiatry (n = 83, 11.1%) and physical therapy (n = 48, 6.4%). Relative to primary care, entry in physiatry increased risk for radiographs (OR = 3.46, P = 0.001), advanced imaging (OR = 3.38, P < 0.001), injections (OR = 4.91, P < 0.001), surgery (OR = 4.76, P = 0.012) and LBP-related costs (standardized B = 0.67, P < 0.001). Entry in chiropractic was associated with decreased risk for advanced imaging (OR = 0.21, P = 0.001) or a surgeon visit (OR = 0.13, P = 0.005) and increased episode of care duration (standardized B = 0.51, P < 0.001). Entry in physical therapy decreased risk of radiographs (OR = 0.39, P = 0.017) and no patient entering in physical therapy had surgery.

CONCLUSIONS:

Entry setting for LBP was associated with future health care utilization and costs. Consideration of where patients chose to enter care may be a strategy to improve outcomes and reduce costs.

© 2015 John Wiley & Sons, Ltd.

KEYWORDS:

care pathways; economic analysis; health care utilization; health services research; low back pain

PMID: 26417660

Catastrophizing

Health Qual Life Outcomes. 2015 Sep 30;13(1):163. doi: 10.1186/s12955-015-0359-5.

The reciprocal effect of pain catastrophizing and satisfaction with participation in the multidisciplinary treatment of patients with chronic back pain.

Farin E¹.

Abstract

BACKGROUND:

The aim of the study was to examine the reciprocity between pain catastrophizing, social participation and quality of life outcomes (pain intensity, pain disability, negative affectivity) in patients with low back pain in a multidisciplinary pain treatment.

METHODS:

Patients undergoing inpatient rehabilitation were surveyed at the beginning and two weeks after the end of rehabilitation. N = 262 low back pain patients participated (mean age: 52.2, 62.1 % female). A two-wave cross-lagged design and structural equation modeling were used to analyze data.

RESULTS:

We found evidence of reciprocal relations with regard to several outcomes. For example, pain catastrophizing at the beginning of treatment is associated with negative affectivity after rehabilitation, and the post-treatment value of pain catastrophizing is associated with pain disability and satisfaction with participation at the start of treatment. Pain disability and pain catastrophizing are predictors of lower treatment outcome while pain intensity and negative affectivity are not risk factors. Participation stands in a reciprocal relationship with some of the pain treatment outcomes. The surprising result, namely, that those patients more satisfied with social participation experience less improvement regarding catastrophizing, can be explained by ceiling effects and the Communal Coping Model.

CONCLUSIONS:

This study provides evidence of the importance of taking reciprocal relations among pain catastrophizing, social participation and other pain outcomes into account. Providers of multidisciplinary pain treatment need to play attention to patients at risk with high disability and catastrophizing thoughts. Pain treatment would benefit from closer integration of psychosocial measures to foster social participation.

PMID: 26420426

3. DISC

Swelling and disc

Eur Spine J. 2015 Sep 24.

The effect of simulated microgravity on lumbar spine biomechanics: an in vitro study.

Laws CJ¹, Berg-Johansen B¹, Hargens AR², Lotz JC³.

Abstract

PURPOSE:

Disc herniation risk is quadrupled following spaceflight. This study tested the hypothesis that swelling-induced disc height increases (comparable to those reported in spaceflight) stiffen the spine and elevate annular strain and nuclear pressure during forward bending.

METHODS:

Eight human lumbar motion segments were secured to custom-designed testing jigs and subjected to baseline flexion and compression and pure moment flexibility tests. Discs were then free-swelled in saline to varying supraphysiologic heights consistent with prolonged weightlessness and re-tested to assess biomechanical changes.

RESULTS:

Swelling-induced disc height changes correlated positively with intradiscal pressure ($p < 0.01$) and stiffening in flexion ($p < 0.01$), and negatively with flexion range of motion ($p < 0.05$). Swelling-induced increases in disc height also led to increased annular surface strain under combined flexion with compression. Disc wedge angle decreased with swelling ($p < 0.05$); this loss of wedge angle correlated with decreased flexion range of motion ($R^2 = 0.94$, $p < 0.0001$) and decreased stiffness fold change in extension ($p < 0.05$).

CONCLUSION:

Swelling-induced increases in disc height decrease flexibility and increase annular strain and nuclear pressure during forward bending. These changes, in combination with the measured loss of lordotic curvature with disc swelling, may contribute toward increased herniation risk. This is consistent with clinical observations of increased disc herniation rates after microgravity exposure and may provide the basis for future countermeasure development.

KEYWORDS:

Biomechanics; Herniation; Intervertebral disc; Microgravity; Spaceflight

PMID: 26403291

Lumbar disc modic changes

Spine J. 2015 Oct 6. pii: S1529-9430(15)01506-5. doi: 10.1016/j.spinee.2015.09.060.

Modic changes of the lumbar spine: prevalence, risk factors and association with disc degeneration and low back pain in a large-scale population-based cohort.

Mok FP¹, Samartzis D², Karppinen J³, Fong DY⁴, Luk KD¹, Cheung KM⁵.

Abstract

BACKGROUND CONTEXT:

Modic changes (MC) are bone marrow lesions on MRI, suggestive of being associated with low back pain (LBP). Data on determinants of MC and their association with disc degeneration and other spinal phenotypes, as well as that of LBP rely mostly on small-scale patient populations and remain controversial.

PURPOSE:

This study addressed the potential determinants of MC, and their association with disc degeneration and LBP among Southern Chinese.

STUDY DESIGN/SETTING:

A cross-sectional, population-based study.

PATIENT SAMPLE:

This study consisted of 2,449 Southern Chinese volunteers.

METHODS:

Sagittal T2-weighted MRIs of the lumbar spine were assessed for the presence of MC and other spinal phenotypes (e.g. disc degeneration, disc displacement, Schmorl's nodes) in all individuals. Subjects' demographics, occupation, lifestyle and clinical profiles were assessed.

RESULTS:

The overall prevalence of MC was 5.8% (n=141), which increased with advancing age. MC predominantly occurred at the two lowest levels (83%). In the multivariate analyses, only the presence of disc displacement, and a higher disc degeneration score were associated with MC at the upper lumbar levels (L1/2 - L3/4) (p<0.01). The presence of MC at the lowest levels (L4/5 - L5/S1) were associated with age, the presence of Schmorl's nodes, disc degeneration/displacement, and historical lumbar injury (p<0.01). Subjects who were both smokers and overweight/obese had increased likelihood of MC in the lower spine (OR: 2.18; 95% CI: 1.10 - 4.30). The presence of MC at the lower lumbar levels were associated with historical LBP (OR: 1.93; 95% CI: 1.05 - 3.54) and with severity and duration of symptoms (p<0.05).

CONCLUSIONS:

Based on one of the largest MRI studies to assess lumbar MC, we noted that MC were associated with both disc degeneration and the presence and severity of LBP. Determinants and association of MC with disc degeneration and clinical symptoms in the upper versus the lower lumbar spine were different. Our study further stresses the significance of MC as important imaging phenotypes associated with LBP.

Copyright © 2015. Published by Elsevier Inc.

KEYWORDS:

Modic; degeneration; disc; endplate; lumbar; phenotype; spine, MRI

PMID: 26456851

Facet tropisms and disc herniations

Irregular alteration of facet orientation in lumbar segments: possible role in pathology of lumbar disc herniation in adolescents

Honggang Wang, M.D Zhengfeng Zhang, M.D, Ph.D Yue Zhou, M.D, Ph.D

DOI: <http://dx.doi.org/10.1016/j.wneu.2015.09.029>

Abstract

Background

The role of the overall structural feature of facet joint in the development of lumbar disc herniation (LDH) is unclear. The present study aimed to investigate the role of irregular alteration of facet orientation (IAFO) in low lumbar segments in pathology of LDH in adolescents.

Methods

Sixty-five adolescents with LDH were included in the study. Facet angles were measured in MR image. The IAFO was defined as the irregular orientation of the included facet joints angle which was regularly increased from L3 to S1 in the normal group, including small-large-small (SLS) type, large-small-large (LSL) type and large-small-smaller (LSS) type. Thirty normal adolescents without lumbar lesions were selected into control group. Statistical analysis was performed using Chi-square test.

Results

IAFO was observed in 20 of 65 subjects in LDH group compared with 3 of 30 in control group [$p=0.038$, $OR=4$ (1.086, 14.735)]. The (SLS) type was observed in 14 patients and (LSL) type was found in 6 patients compared with 2 and 1 respectively in the control group, no LSS type was found in the two groups. 8 subjects with IAFO of SLS style herniated in L5/S1 level compared with 6 subjects in L4/5. One subject with IAFO of LSL style herniated in L5/S1 level compared with 5 in L4/5.

Conclusions

The findings of the present study suggested that the IAFO in lumbar spine was associated with lumbar disc herniation in adolescents.

Key words:

Lumbar disc herniation, Facet joint, Facet tropism, Adolescents, Magnetic Resonance Imaging

Degenerative discs

Study of Double-level Degeneration of Lower Lumbar Spines by Finite Element Model

Yungang Wu* Jinhui Wu* Junjie Guan Ningfang Mao Chunwen Lu Runxiao Lv Muchen Ding
Zhicai Shi Bin Cai

DOI: <http://dx.doi.org/10.1016/j.wneu.2015.09.038>

Highlights

- Finite element model is a widely-used method for the study of spinal mechanical behaviors in the intervertebral disc degeneration.
- Double-level degeneration had differing effects on extension & flexion, bending, and torsion of the range of motion in intervertebral discs.
- The changes in the biomechanics of degenerating discs may provide insights for the clinical intervention of double-level degeneration.

Abstract**Background**

Degeneration of intervertebral discs (IVD) in the lower lumbar spine is associated with significant structural alterations. Finite element model (FEM) has been widely used in the study of spinal mechanical behaviors. This study used this technique to characterize the motional influence to the double-level (L4-5 and L5-S) degeneration.

Methods and Results

Three grades of disc degeneration were modeled with the changes in geometry and material properties. In the extension and flexion of range of motion (ROM), single segment degeneration in L4-5 or L5-S resulted in a decreased angle in itself and increased angle in the other segment. Double-level degeneration resulted in a decreased rotation in both segments. Bending resulted in a decreased ROM in all three grades of degeneration in the double-level degeneration. In torsion loading, mild and moderate single degeneration in L4-5 and L5-S increased the rotation angle. In double-level degeneration, mild and moderate L4-5 degeneration increased the L4-5 rotation angle by 14-19%. In contrast, severe L4-5 decreased L4-5 rotation angle. Concurrently, mild and moderate L5-S degeneration increased the rotation angle respectively by 15% and 6%, and severe degeneration decreased the rotation angle by 29%.

Conclusions

Different loading motions in double-level degeneration had differing effects on the ROM. These changes are important to understand the biomechanics of the progression of disc degeneration in the lower lumbar spine. Our results provide insights for the clinical intervention of double-level IVD.

Key words:

Degeneration, Lower Lumbar Spines, Finite Element Model

Fibrotic changes**Fibrotic-like changes in degenerate human intervertebral discs revealed by quantitative proteomic analysis**

Anita Yee Maggie P.Y. Lam Vivian Tam Wilson CW. Chan Ivan K. Chu Kathryn S.E. Cheah Kenneth M.C. Cheung (Professor Danny Chan (Professor)

DOI: <http://dx.doi.org/10.1016/j.joca.2015.09.020>

Abstract**Objective**

Intervertebral disc degeneration can lead to symptomatic conditions including sciatica and back pain. The purpose of this study is to understand the extracellular matrix changes in disc biology through comparative proteomic analysis of degenerated and non-degenerated human intervertebral disc tissues of different ages.

Design

Seven non-degenerated (11 – 46 years of age) and seven degenerated (16 – 53 years of age) annulus fibrosis (AF) and nucleus pulposus (NP) samples were used. Proteins were extracted using guanidine hydrochloride, separated from large proteoglycans by caesium chloride density gradient ultracentrifugation, and identified using liquid chromatography coupled with tandem mass spectrometry (MS/MS). For quantitative comparison, proteins were labeled with iTRAQ reagents. Collagen fibrils in the NP were assessed using scanning electron microscopy.

Results

In the AF, quantitative analysis revealed increased levels of HTRA1, COMP and CILP in degeneration when compared with samples from older individuals. Fibronectin showed increment with age and degeneration. In the NP, more CILP and CILP2 were present in degenerated samples of younger individuals. Reduced protein solubility was observed in degenerated and older non-degenerated samples correlated with an accumulation of type I collagen in the insoluble fibers. Characterization of collagen fibrils in the NP revealed smaller mean fibril diameters and decreased porosity in the degenerated samples.

Conclusions

Our study identified distinct matrix changes associated with aging and degeneration in the intervertebral discs. The nature of the extracellular matrix changes, together with observed decreased in solubility and changes in fibril diameter is consistent with a fibrotic-like environment.

Keywords:

Intervertebral disc, disc degeneration, fibrosis, proteome, mass spectrometry, quantitative method

5. SURGERY

Vit D levels diminished in failed fusions

Spine (Phila Pa 1976). 2015 Oct 1;40(19):1536-41. doi: 10.1097/BRS.0000000000001041.

Vitamin D Levels and 1-Year Fusion Outcomes in Elective Spine Surgery: A Prospective Observational Study.

Ravindra VM¹, Godzik J, Dailey AT, Schmidt MH, Bisson EF, Hood RS, Cutler A, Ray WZ.

Abstract

STUDY DESIGN:

Prospective observational study.

OBJECTIVE:

To investigate the association of perioperative vitamin D levels and nonunion rates and time to fusion in patients undergoing elective spine fusion.

SUMMARY OF BACKGROUND DATA:

Although there is a clear link between bone mineral density and the risk of osteoporosis, it is unclear whether low vitamin D levels affect rates and timing of spinal fusion.

METHODS:

Serum 25-OH vitamin D levels were measured perioperatively in adults undergoing elective spinal fusion between 2011 and 2012. Vitamin D levels <20 ng/mL were considered deficient. Univariate and multivariate logistic regression were performed to identify independent predictors of pseudarthrosis/nonunion within a minimum follow-up period of 12 months. Kaplan-Meier analysis was used to compare time to fusion between groups.

RESULTS:

Of the 133 patients, 31 (23%) demonstrated vitamin D deficiency. Mean patient age was 57 ± 13 years; 44% were female and 94% were Caucasian. The cervical spine was fused in 49%, the lumbar spine in 47%, and the thoracic spine in 4%. Mean construct length was 2 levels (range 1-16). At 12-month follow-up, 112/133 (84%) patients demonstrated fusion (median time to fusion 8.4 mo). Nonunion at 12 months was associated with vitamin D deficiency (20% of patients with adequate vitamin D level vs. 38% of vitamin D-deficient patients, $P = 0.063$). Kaplan-Meier survival analysis demonstrated time to fusion was significantly longer in the vitamin D-deficient group (12 vs. 6 mo, $P = 0.001$). On multivariate analysis, vitamin D deficiency was an independent predictor of nonunion (odds ratio 3.449, $P = 0.045$) when adjusted for age, sex, obesity, fusion length, location, graft type, smoking, and bone morphogenetic protein use.

CONCLUSION:

Vitamin D levels may affect nonunion rate and time to fusion. These results offer insight into the importance of the metabolic milieu for bony fusion as well as a potential avenue for therapeutic intervention.

LEVEL OF EVIDENCE: 3.

PMID: 26165222

Catastrophizing and persistent pain

Arch Phys Med Rehabil. 2015 Oct;96(10):1763-70. doi: 10.1016/j.apmr.2015.06.003. Epub 2015 Jun 20.

Pain Sensitivity and Pain Catastrophizing Are Associated With Persistent Pain and Disability After Lumbar Spine Surgery.

Coronado RA¹, George SZ², Devin CJ¹, Wegener ST³, Archer KR⁴.

Abstract

OBJECTIVE:

To examine whether pain sensitivity and pain catastrophizing are associated with persistent pain and disability after lumbar spine surgery.

DESIGN:

Prospective observational cohort study.

SETTING:

Academic medical center.

PARTICIPANTS:

Patients (N=68; mean age, 57.9±13.1y; 40 women [58.8%]) undergoing spine surgery for a degenerative condition from March 1, 2012 to April 30, 2013 were assessed 6 weeks, 3 months, and 6 months after surgery.

INTERVENTIONS:

Not applicable.

MAIN OUTCOME MEASURES:

The main outcome measures were persistent back pain intensity, pain interference, and disability. Patients with persistent back pain intensity, pain interference, or disability were identified as those patients reporting Brief Pain Inventory scores ≥ 4 and Oswestry Disability Index scores ≥ 21 at all postoperative time points.

RESULTS:

From 6 weeks to 6 months after surgery, approximately 12.9%, 24.2%, and 46.8% of patients reported persistent back pain intensity, pain interference, or disability, respectively. Increased pain sensitivity at 6 weeks was associated with having persistent back pain intensity (odds ratio [OR], 2.0; 95% confidence interval [CI], 1.0-4.1) after surgery. Increased pain catastrophizing at 6 weeks was associated with having persistent back pain intensity (OR, 1.1; 95% CI, 1.0-1.2), pain interference (OR, 1.1; 95% CI, 1.0-1.2), and disability (OR, 1.3; 95% CI, 1.1-1.4). An interaction effect was not found between pain sensitivity and pain catastrophizing on persistent outcomes ($P > .05$).

CONCLUSIONS:

The findings suggest the importance of early postoperative screening for pain sensitivity and pain catastrophizing to identify patients at risk for poor postoperative pain intensity, pain interference, and/or disability outcomes. Future research should consider the benefit of targeted therapeutic strategies for patients with these postoperative prognostic factors.

Copyright © 2015 American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved.

KEYWORDS: *Catastrophization; Low back pain; Lumbar stenosis; Pain threshold; Prognosis; Rehabilitation* PMID:26101845

7. PELVIC ORGANS/WOMAN'S HEALTH

Sex and prostrate removal

Eur Urol. 2015 Nov;68(5):899-905. doi: 10.1016/j.eururo.2015.07.074. Epub 2015 Aug 17.

Unexpected Long-term Improvements in Urinary and Erectile Function in a Large Cohort of Men with Self-reported Outcomes Following Radical Prostatectomy.

Lee JK¹, Assel M², Thong AE³, Sjoberg DD², Mulhall JP³, Sandhu J³, Vickers AJ², Ehdai B³.

Abstract

BACKGROUND:

It is generally assumed that if a man does not regain urinary continence or erectile function within 12 mo of radical prostatectomy (RP), then the chance of subsequent recovery is low.

OBJECTIVE:

To determine the probability of achieving good urinary function (UF) or erectile function (EF) up to 48 mo postoperatively in men who reported poor UF or EF at 12 mo after RP.

DESIGN, SETTING, AND PARTICIPANTS:

We identified 3187 patients who underwent RP from 2007 through 2013 at a tertiary institution and had extended multidisciplinary follow-up with patient-reported UF and EF scores at ≥ 12 mo.

INTERVENTION:

Open or minimally invasive RP.

OUTCOME MEASUREMENTS AND STATISTICAL ANALYSIS:

Primary outcome was good UF as defined by a urinary score ≥ 17 (range: 0-21) or good EF as defined by a modified International Index of Erectile Function-6 score ≥ 22 (range: 1-30). The probability of functional recovery beyond 12 mo was determined by Kaplan-Meier analyses.

RESULTS AND LIMITATIONS:

Among patients incontinent at 12 mo, the probability of achieving good UF at 24, 36, and 48 mo was 30%, 49%, and 59%. In patients experiencing erectile dysfunction at 12 mo, the probability of recovering EF at 24, 36, and 48 mo was 22%, 32%, and 40%. On multivariable analyses, 12-mo functional score and age were associated with recovery, but only score was consistently significant.

CONCLUSIONS:

Men with incontinence or erectile dysfunction at 12 mo have higher than anticipated rates of subsequent functional improvement. Probability of recovery is strongly influenced by score at 12 mo. Further research should address the impact of ongoing multidisciplinary follow-up care on our observed rates of recovery.

PATIENT SUMMARY:

Many prostate cancer patients continue to recover urinary and erectile function after 12 mo. The level of functional recovery by 12 mo is associated with long-term recovery and should be discussed by the physician and patient when deciding on rehabilitative interventions.

KEYWORDS:

Erectile dysfunction; Patient-reported outcomes; Radical prostatectomy; Urinary incontinence

PMID: 26293181

Endometriosis

J Obstet Gynaecol Res. 2015 Sep 30. doi: 10.1111/jog.12817.

Long-lasting analgesic effect of transcranial direct current stimulation in treatment of chronic endometriosis pain.

Rostami R^{1,2,3}, Badran BW¹, Kazemi R^{3,4}, Habibnezhad M^{3,5}, George MS^{1,6}.

Abstract

Approximately 10-20% of women of reproductive age suffer from endometriosis, with 70-90% of these women reporting chronic pain symptoms that persist during their menstrual cycle. We are presenting a case in which a novel form of noninvasive brain stimulation called transcranial direct current stimulation was used as an intervention in a 32-year-old woman with persistent, chronic pain symptoms caused by endometriosis for 20 years.

Ten daily, 20-min sessions of 2-mA anodal transcranial direct current stimulation were applied over the left primary motor cortex. Acutely, visual analog scale pain symptoms were reduced by 60%. There were also significant decreases in modules of the Endometriosis Health Profile. At the 4-month follow-up, the patient still expressed an overall decrease in pain symptoms of 30%.

© 2015 Japan Society of Obstetrics and Gynecology.

KEYWORDS:

endometriosis; motor cortex; pain; transcranial direct current stimulation

PMID: 26419900

Menopausal sex**Menopausal women experiencing distressing pain during sex suffer due to misperceptions**

Wednesday, September 30, 2015

CLEVELAND – Results from qualitative research of postmenopausal women with vulvar and vaginal atrophy (VVA) show that they recognize the significant physical, emotional and psychological consequences of untreated dyspareunia (painful sex) yet they continue to suffer because of misperceptions about the condition and a general lack of understanding about treatment options.

Sheryl A. Kingsberg, PhD, Chief of Behavioral Medicine in the Department of OB/GYN at University Hospitals Case Medical Center in Cleveland, will present the findings during an oral presentation, “Women’s Attitudes and Behaviors towards Vulvar and Vaginal Atrophy.” The presentation is scheduled for Oct. 1 at 4:45 p.m. PDT at The North American Menopause Society (NAMS) 2015 Annual Meeting, held at Caesar’s Palace in Las Vegas from Sept. 30-Oct. 3, 2015. This announcement was made by University Hospitals Case Medical Center and TherapeuticsMD, Inc. (NYSE MKT: TXMD). This qualitative research was funded by TherapeuticsMD.

“Many women continue to experience pain during sex because they mistakenly believe VVA to be a sexual consequence of aging instead of the true medical condition that we know it to be,” said Dr. Kingsberg, who is also Professor of Reproductive Biology and Psychiatry at Case Western Reserve University School of Medicine. “Although they characterize their symptoms in medical terms – severe pain, sensitivity and soreness that lasts for days, and vaginal bleeding and irritation – they perceive these symptoms to be part of a sexual problem that is not supposed to be discussed with, and managed by, a health care professional. This may help explain why VVA remains underdiagnosed and undertreated, with only 7 percent of women who experience symptoms treated with prescription therapy.”[†]

8. VISCERA

IBS and pain sensitivity

Neurogastroenterol Motil. 2015 Oct 14. doi: 10.1111/nmo.12689. [Epub ahead of print]

Psychological factors selectively upregulate rectal pain perception in hypersensitive patients with irritable bowel syndrome.

Grinsvall C^{1,2}, Törnblom H^{1,2}, Tack J³, Van Oudenhove L³, Simrén M^{1,2}.

Abstract

BACKGROUND:

Visceral hypersensitivity and psychological symptoms are frequent features in irritable bowel syndrome (IBS). Exploring mechanistic pathways leading to visceral hypersensitivity is of importance to direct future studies and treatment options. In this study, we evaluated the contribution of psychological factors to the perception of painful and non-painful rectal sensations in hyper- vs normosensitive IBS patients.

METHODS:

We included 138 IBS patients (Rome II criteria) who underwent an ascending method of limited rectal balloon distension paradigm. At the end of each distension step, subjects rated the perceived intensity of non-painful ('unpleasantness') and painful rectal sensations on visual analog scales. Sensitivity status was determined based on pain thresholds. Anxiety, depression and somatization were assessed by questionnaires. Mixed models were used to test the relationship between sensitivity status, psychological variables, and pain & unpleasantness ratings upon increasing distension.

KEY RESULTS:

Hypersensitive IBS patients had lower sensory thresholds for pain, first perception, urge to defecate, and discomfort ($p < 0.0001$). Upon increasing distension, they rated both painful and non-painful sensations as more intense than normosensitive patients ($p < 0.0001$). Psychological factors were associated with higher pain ratings during distension in hypersensitive ($p < 0.006-0.0001$), but not in normosensitive patients. Anxiety, but not depression or somatization, was associated with increased intensity ratings of non-painful sensations ($p < 0.001$), independent of sensitivity status.

CONCLUSIONS & INFERENCES:

Hypersensitive IBS patients are characterized by increased perception of pain, but also of non-painful sensations. Psychological factors increase the perception of painful sensations in hypersensitive patients only, whereas non-painful visceral sensations were exaggerated in anxious patients regardless of the sensitivity status.

© 2015 John Wiley & Sons Ltd.

KEYWORDS:

afferent pathways; irritable bowel syndrome; psychological factors; visceral hypersensitivity; visceral sensory processing

PMID: 26467837

Crohn's and nutrition

Surg Today. 2015 Oct 5.

Influence of nutritional status on the therapeutic effect of infliximab in patients with Crohn's disease.

Sumi R^{1,2}, Nakajima K³, Iijima H⁴, Wasa M⁵, Shinzaki S⁴, Nezu R⁶, Inoue Y¹, Ito T^{2,7}.

Abstract

PURPOSE:

Crohn's disease (CD) is a refractory inflammatory bowel disease of unknown etiology, frequently complicated by malnutrition. It is thought that the delayed wound healing associated with this malnutrition in CD patients might adversely affect the therapeutic benefits of infliximab (IFX). Therefore, we investigated the effects of nutritional status on IFX treatment.

METHODS:

We assessed nutritional status and CD activity when IFX therapy was initiated and following the third dose, 6 weeks later. Nutritional status was assessed using the body mass index (BMI) and nutritional risk index (NRI), whereas CD activity was assessed using the CD activity index (CDAI).

RESULTS:

All patients with a BMI ≥ 18.5 kg/m² at the time of IFX therapy met the effective criteria for the CDAI, and IFX treatment was considered responsive in these patients. Furthermore, IFX treatment was responsive, with a high level of effectiveness, in all five subjects (31.3 %) with NRI scores of 97.5 and above with no risk of malnutrition ($p = 0.037$).

CONCLUSIONS:

Our results suggest that nutritional status does influence the therapeutic effect of IFX in CD patients. The response rate to IFX treatment thus could be improved by optimizing the nutritional status. We recommend comprehensive nutritional assessment and intervention prior to IFX treatment schedules.

KEYWORDS:

Body mass index; Crohn's disease; Infliximab; Nutrition; Nutritional risk index

PMID: 26438200

IBS

Clin Gastroenterol Hepatol. 2015 Oct 7. pii: S1542-3565(15)01333-6. doi: 10.1016/j.cgh.2015.09.031.

Irritable Bowel Syndrome and Microscopic Colitis: a Systematic Review and Meta-analysis.

Kamp EJ¹, Kane JS², Ford AC³.

Abstract

BACKGROUND:

& Aims: Patients with microscopic colitis and those with irritable bowel syndrome (IBS) present with similar symptoms. We examined the association between IBS and microscopic colitis in a systematic review and meta-analysis.

METHODS:

We searched the medical literature to identify cross-sectional surveys or case-control studies reporting the association between microscopic colitis and IBS in ≥ 50 unselected adult patients. We recorded the prevalence of IBS symptoms in patients with histologically confirmed microscopic colitis, or the prevalence of histologically confirmed microscopic colitis in patients with IBS. Data were pooled using a random effects model; the association between microscopic colitis and IBS was summarized using an odds ratio (OR) with a 95% confidence interval (CI).

RESULTS:

The search strategy identified 3926 citations, of which 10 were eligible for our analysis. The pooled prevalence of IBS in patients with microscopic colitis was 33.4% (95% CI, 31.5%-40.6%), but was not significantly higher in patients with microscopic colitis than in patients with diarrhea (OR, 1.39; 95% CI, 0.43-4.47). In 3 cross-sectional surveys, the pooled OR for microscopic colitis in participants with IBS, compared with other patients with diarrhea, was 0.68 (95% CI, 0.44-1.04). In 4 case-control studies prevalence of IBS in patients with microscopic colitis was significantly higher than in asymptomatic controls (OR, 5.16; 95% CI, 1.32-20.2).

CONCLUSIONS:

Based on a meta-analysis, one-third of patients with microscopic colitis reported symptoms compatible with IBS, but the prevalence of IBS was no higher than other patients with diarrhea. Odds of microscopic colitis were no higher in patients with IBS compared to other patients with diarrhea. The value of routine colonoscopy and biopsy to exclude microscopic colitis in patients with typical IBS symptoms, unless other risk factors or alarm symptoms are present, remains uncertain.

Copyright © 2015 AGA Institute. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

abdominal pain; collagenous colitis; inflammation; lymphocytic colitis

PMID: 26453949

Constipation

Curr Gastroenterol Rep. 2015 Dec;17(12):47. doi: 10.1007/s11894-015-0471-z.

Chronic Constipation: a Review of Current Literature.

Sbahi H¹, Cash BD².

Abstract

Chronic constipation is a common health condition representing a substantial proportion of primary care visits and referrals to specialist providers. Chronic constipation can have a significant negative effect on health-related quality of life and has been associated with psychological distress in severely affected patients. It has the potential to cause patients to curtail work, school, and social activities. While different pathophysiological mechanisms have been implicated in the development of chronic constipation, in some instances, the causes of chronic constipation are not easily determined. E

xpenditures for the evaluation and management of chronic constipation represent a significant burden on patients and payers, and it is important for clinicians to have a clear understanding of the different pathophysiological mechanisms associated with constipation, understand the different testing modalities and treatments that are available including their appropriateness and limitations, and tailor that knowledge to the management of individual patients.

KEYWORDS:

Chronic constipation; Constipation; Dyssynergic defecation; Management of chronic constipation; Pelvic floor dysfunction; Types of constipation

PMID: 26449614

Constipation and microbes**Relationship between microbiota of the colonic mucosa vs feces and symptoms, colonic transit, and methane production in female patients with chronic constipation**

Gastroenterology, 10/13/2015 Parthasarathy G, et al.

The authors compared the colonic mucosal and fecal microbiota in patients with chronic constipation and in healthy subjects to investigate the relationships between microbiota and other parameters. After adjusting for diet and colonic transit, the profile of the microbiota in the colonic mucosa could discriminate patients with constipation from healthy individuals. The profile of the fecal microbiota was associated with colonic transit and methane production (measured in breath), but not constipation.

Methods

- **Sigmoid colonic mucosal and fecal microbiota samples were collected from 25 healthy women (controls) and 25 women with chronic constipation and evaluated by 16S ribosomal RNA gene sequencing (average of 49,186 reads/sample).**
- **The authors assessed associations between microbiota (overall composition and operational taxonomic units) and demographic variables, diet, constipation status, colonic transit, and methane production (measured in breath samples after oral lactulose intake).**

Results

- **Fourteen patients with chronic constipation had slow colonic transit.**
- **The profile of the colonic mucosal microbiota differed between constipated patients and controls ($P < .05$).**
- **The overall composition of the colonic mucosal microbiota was associated with constipation, independent of colonic transit ($P < .05$) and discriminated between patients with constipation and controls with 94% accuracy.**
- **Genera from Bacteroidetes were more abundant in the colonic mucosal microbiota of patients with constipation.**
- **The profile of the fecal microbiota was associated with colonic transit before adjusting for constipation, age, body mass index, and diet; genera from Firmicutes (Faecalibacterium, Lactococcus, and Roseburia) correlated with faster colonic transit.**
- **Methane production was associated with the composition of the fecal microbiota, but not with constipation or colonic transit.**

Micronutrient deficiencies in IBS

Curr Opin Clin Nutr Metab Care. 2015 Nov;18(6):576-81. doi:
10.1097/MCO.0000000000000226.

Micronutrient deficiencies in inflammatory bowel disease.

Weisshof R¹, Chermesh I.

Abstract

PURPOSE OF REVIEW:

Malnutrition, protein-energy, and micronutrient deficiencies are common among patients with inflammatory bowel disease (IBD). The deficiencies are a manifestation of the complicated disease and a cause of morbidity. The present review summarizes recent advances and evidence-based knowledge regarding micronutrients in relation to patients with IBD.

RECENT FINDINGS:

Micronutrient deficiencies occur in more than half of patients with IBD. Most common are deficiencies of iron, B12, vitamin D, vitamin K, folic acid, selenium, zinc, vitamin B6, and vitamin B1. Deficiencies are more common in Crohn's disease than in ulcerative colitis, and more in active disease than at times of remission. Micronutrient deficiency is associated with prolonged and complicated course of disease. Iron deficiency is the most common cause for anemia. Definite diagnosis of B12 deficiency cannot be established by serum levels alone. Vitamin D and vitamin K deficiencies are thought to be associated with heightened inflammatory state. The relationship of these deficiencies with bone disease is controversial. The present review focuses on the significance, epidemiology, treatment options, and recommendations regarding micronutrient deficiencies in IBD.

SUMMARY:

Micronutrient deficiencies are common and have clinical significance. High suspicion for micronutrient deficiencies is advocated so that treatable causes of morbidity are treated appropriately and late and irreversible sequelae are prevented.

PMID: 26418823

Smoking and Crohn's disease

Aliment Pharmacol Ther. 2015 Oct 4. doi: 10.1111/apt.13423.

Smoking behaviour and knowledge of the health effects of smoking in patients with inflammatory bowel disease.

De Bie C¹, Ballet V¹, Hendriks N², Coenen S^{1,2}, Weyts E¹, Van Assche G^{1,2}, Vermeire S^{1,2}, Ferrante M^{1,2}.

Abstract

BACKGROUND:

The detrimental effect of smoking on development and progression of Crohn's disease (CD) is generally accepted.

AIM:

We evaluated the awareness of smoking risks in the Belgian inflammatory bowel disease (IBD) population.

METHODS:

In the out-patient clinic of a tertiary referral centre, 625 consecutive patients with CD, 238 patients with ulcerative colitis (UC) and 289 non-IBD controls, filled out a simple questionnaire. This questionnaire included data on smoking behaviour and awareness of smoking-related health effects, including effects on IBD.

RESULTS:

At diagnosis, more CD patients were active smokers compared to UC (40% vs. 17%, $P < 0.001$). Remarkably, smoking cessation rates after diagnosis were similar for CD and UC (both 56%, $P = 0.997$). The great majority recognised a detrimental influence of smoking on general health (98-99%), lung cancer (95-97%), myocardial infarction (89-92%) and stroke (78-87%). Although CD patients more frequently acknowledged risks of smoking on their disease, only 37% were aware of a link with CD development, 30% of increased surgical rates and 27% of increased post-operative CD recurrence. Active smokers more frequently denied an increased risk of surgery and higher post-operative CD recurrence. Intriguingly, within the active smokers with CD, those not willing to quit smoking most often denied a potential bad influence of smoking. Taking into account disease duration, previous surgery, education level, working status and nicotine dependence, we were unable to define specific subgroups of patients requiring extra education.

CONCLUSION:

Although patients with Crohn's disease were better informed on the detrimental effects of smoking, the awareness rate was still low.

© 2015 John Wiley & Sons Ltd.

PMID: 26435040

10 A. CERVICAL SPINE

Factors for chronic neck pain

J Pain. 2015 Sep 20. pii: S1526-5900(15)00867-6. doi: 10.1016/j.jpain.2015.09.002.

Psychosocial, physical, and neurophysiological risk factors for chronic neck pain: A prospective inception cohort study.

Shahidi B¹, Curran-Everett D², Maluf KS³.

Abstract

The purpose of this investigation was to identify modifiable risk factors for the development of first-onset chronic neck pain among an inception cohort of healthy individuals working in a high risk occupation. Candidate risk factors identified from previous studies were categorized into psychosocial, physical, and neurophysiological domains, which were assessed concurrently in a baseline evaluation of 171 office workers within the first 3 months of hire. Participants completed monthly online surveys over the subsequent year to identify the presence of chronic interfering neck pain, defined as a Neck Disability Index score ≥ 5 points for 3 or more months. Data were analyzed using backwards logistic regression to identify significant predictors within each domain, which were then entered into a multivariate regression model adjusted for age, sex, and body mass index. Development of chronic interfering neck pain was predicted by depressed mood (OR=3.36(1.10-10.31), $p=0.03$), cervical extensor endurance (OR=0.92(0.87-0.97), $p=0.001$), and diffuse noxious inhibitory control (OR=0.90(0.83-0.98), $p=0.02$) at baseline.

These findings provide the first evidence that individuals with pre-existing impairments in mood and descending pain modulation may be at greater risk for developing chronic neck pain when exposed to peripheral nociceptive stimuli such as that produced during muscle fatigue.

PERSPECTIVE:

Depressed mood, poor muscle endurance, and impaired endogenous pain inhibition are predisposing factors for the development of new onset chronic neck pain of non-specific origin in office workers. These findings may assist with primary prevention by allowing clinicians to screen for individuals at risk of developing chronic neck pain.

Copyright © 2015 American Pain Society. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

chronic; neck pain; prospective; risk factors

PMID: 26400680

Adolescent's weakness and neck pain**Neck muscle endurance and head posture: a comparison between adolescents with and without neck pain**

Ana Carolina Oliveira, MSc Anabela G. Silva, PhD

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.002>

Highlights

- Neck pain in adolescents is of considerable duration and frequency
- Neck pain in adolescents interferes with daily activities
- Adolescents with neck pain have decreased neck flexor endurance capacity
- Adolescents with neck pain have decreased neck extensor endurance capacity
- There is a need for early interventions targeting adolescents with neck pain

Abstract**Objective**

The main aims of this study were to compare the neck flexor and extensor endurance and forward head posture between adolescents with and without neck pain. The secondary aims were to explore potential associations between muscles endurance, head posture and neck pain characteristics and to assess intra-rater reliability of the measurements used.

Methods

Adolescents with neck pain (n=35) and age-matched asymptomatic adolescents (n=35) had their forward head posture, neck flexor endurance and neck extensor endurance measured using clinical tests. Intra-rater reliability was also assessed.

Results

Forward head posture and neck flexor and extensor endurance tests showed moderate to almost perfect intra-rater reliability (ICC between 0.58 and 0.88). Adolescents with neck pain showed significantly less forward head posture (neck pain=46.62±4.92; asymptomatic=44.18°±3.64°, p>0.05) and less neck flexor (neck pain=24.50±23.03s; asymptomatic=35.89±21.53s, p>0.05) and extensor endurance (neck pain=12.6.64±77.94s; asymptomatic=168.66±74.77s, p>0.05) than asymptomatic adolescents.

Conclusions

Results suggest that changes in posture and neck muscle endurance are a feature of adolescents with neck pain.

Keywords: *neck pain, endurance, forward head posture, adolescents*

PT and neck pain effective

Arch Phys Med Rehabil. 2015 Oct;96(10):1756-62. doi: 10.1016/j.apmr.2015.06.012. Epub 2015 Jul 9.

Description of Common Clinical Presentations and Associated Short-Term Physical Therapy Clinical Outcomes in Patients With Neck Pain.

Horn ME1, Brennan GP2, George SZ3, Harman JS4, Bishop MD5.

Abstract

OBJECTIVE:

To determine the effect of clinical presentations of neck pain on short-term physical therapy outcomes.

DESIGN:

Retrospective analysis of pair-matched groups from a clinical cohort.

SETTING:

Thirteen outpatient physical therapy clinics in 1 health care system.

PARTICIPANTS:

Patients (N=1069) grouped by common clinical presentations of neck pain: nonspecific neck pain (NSNP) with duration <4 weeks; NSNP with duration >4 weeks; neck pain with arm pain; neck pain with headache; and neck pain from whiplash.

INTERVENTION:

Conservative interventions provided by physical therapists.

MAIN OUTCOME MEASURES:

Neck Disability Index (NDI) and numerical pain rating scale (NPRS) recorded at the initial and last visits. The main outcome of interest was achieving recovery status on the NDI. Changes in NDI and NPRS were compared between clinical presentation groups.

RESULTS:

Compared with patients presenting with NSNP >4 weeks, patients with NSNP <4 weeks had increased odds of achieving recovery status on the NDI ($P<.0001$) and demonstrated the greatest changes in clinical outcomes of pain ($P\leq.0001$) and disability ($P\leq.0001$). Patients with neck pain and arm pain demonstrated an increased odds of achieving recovery status on the NDI ($P=.04$) compared with patients presenting with NSNP >4 weeks.

CONCLUSIONS:

Treating patients with NSNP within <4 weeks of onset of symptoms may lead to improved clinical outcomes from physical therapy compared with other common clinical presentations.

Copyright © 2015 American Congress of Rehabilitation Medicine. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

Disability evaluation; Neck pain; Outcome assessment (health care); Rehabilitation

PMID: 26166733

Disc and symptoms

Immunol Res. 2015 Oct 6.

Exploratory study for identifying systemic biomarkers that correlate with pain response in patients with intervertebral disc disorders.

Weber KT¹, Satoh S¹, Alipui DO¹, Virojanapa J², Levine M², Sison C^{1,3}, Quraishi S^{2,4}, Bloom O^{1,4,3}, Chahine NO^{5,6,7}.

Abstract

Molecular events that drive disc damage and low back pain (LBP) may precede clinical manifestation of disease onset and can cause detrimental long-term effects such as disability. Biomarkers serve as objective molecular indicators of pathological processes. The goal of this study is to identify systemic biochemical factors as predictors of response to treatment of LBP with epidural steroid injection (ESI). Since inflammation plays a pivotal role in LBP, this pilot study investigates the effect of ESI on systemic levels of 48 inflammatory biochemical factors (cytokines, chemokines, and growth factors) and examines the relationship between biochemical factor levels and pain or disability in patients with disc herniation (DH), or other diagnoses (Other Dx) leading to low back pain, which included spinal stenosis (SS) and degenerative disc disease (DDD). Study participants (n = 16) were recruited from a back pain management practice. Pain numerical rating score (NRS), Oswestry Disability Index (ODI), and blood samples were collected pre- and at 7 to 10 days post-treatment. Blood samples were assayed for inflammatory mediators using commercial multiplex assays. Mediator levels were compared pre- and post-treatment to investigate the potential correlations between clinical and biochemical outcomes. Our results indicate that a single ESI significantly decreased systemic levels of SCGF- β and IL-2. Improvement in pain in all subjects was correlated with changes in chemokines (MCP-1, MIG), hematopoietic progenitor factors (SCGF- β), and factors that participate in angiogenesis/fibrosis (HGF), nociception (SCF, IFN- α 2), and inflammation (IL-6, IL-10, IL-18, TRAIL). Levels of biochemical mediators varied based on diagnosis of LBP, and changes in pain responses and systemic mediators from pre- to post-treatment were dependent on the diagnosis cohort. In the DH cohort, levels of IL-17 and VEGF significantly decreased post-treatment. In the Other Dx cohort, levels of IL-2R α , IL-3, and SCGF- β significantly decreased post-treatment. In order to determine whether mediator changes were related to pain, correlations between change in pain scores and change in mediator levels were performed. Subjects with DH demonstrated a profile signature that implicated hematopoiesis factors (SCGF- β , GM-CSF) in pain response, while subjects with Other Dx demonstrated a biomarker profile that implicated chemokines (MCP-1, MIG) and angiogenic factors (HGF, VEGF) in pain response.

Our findings provide evidence that systemic biochemical factors in patients with LBP vary by diagnosis, and pain response to treatment is associated with a unique profile of biochemical responses in each diagnosis group. Future hypothesis-based studies with larger subject cohorts are warranted to confirm the findings of this pilot exploratory study.

KEYWORDS:

Back pain; Epidural steroid injection; Inflammation; Intervertebral disc

PMID: 26440592

Head repositioning test

Eur Spine J. 2015 Oct 5.

Head repositioning accuracy in patients with neck pain and asymptomatic subjects: concurrent validity, influence of motion speed, motion direction and target distance.

Dugailly PM^{1,2}, De Santis R³, Tits M⁴, Sobczak S^{3,5,6}, Vigne A⁵, Feipel V⁵.

Abstract

BACKGROUND:

Cervicocephalic kinesthetic deficiencies have been demonstrated in patients with chronic neck pain (NP). On the other hand, authors emphasized the use of different motion speeds for assessing functional impairment of the cervical spine.

PURPOSE:

The objectives of this study were (1) to investigate the head repositioning accuracy in NP patients and control subjects and (2) to assess the influence of target distance, motion speed, motion direction and pain.

MATERIALS AND METHODS:

Seventy-one subjects (36 healthy subjects and 35 NP patients; age 30-55 years) performed the head repositioning test (HRT) at two different speeds for horizontal and vertical movements and at two different distances. For each condition, six consecutive trials were sampled.

RESULTS:

The study showed the validity and reproducibility of the HRT, confirming a dysfunctional threshold of 4.5°. Normative values of head repositioning error up to 3.6° and 7.1° were identified for healthy and NP subjects, respectively. A distance of 180 cm from the target and a natural motion speed increased HRT accuracy. Repositioning after extension movement showed a significantly larger error in both groups. Intensity, duration of pain as well as pain level did not significantly alter head repositioning error.

CONCLUSIONS:

The assessment of proprioceptive performance in healthy and NP subjects allowed the validation of the HRT. The HRT is a simple, not expensive and fast test, easily implementable in daily practice to assess and monitor treatment and evolution of proprioceptive cervical deficits.

KEYWORDS:

Cervical motion; Concurrent validity; Head repositioning; Neck pain; Proprioception

PMID: 26438174

12 A. WHIPLASH

Whiplash and specific exercises

J. Manipulative Physiol Ther. 2015 Sep;38(7):465-476.e4. doi: 10.1016/j.jmpt.2015.06.011. Epub 2015 Sep 18.

The Effect of 3 Different Exercise Approaches on Neck Muscle Endurance, Kinesiophobia, Exercise Compliance, and Patient Satisfaction in Chronic Whiplash.

Peterson GE1, Landén Ludvigsson MH2, O'Leary SP3, Dederig ÅM4, Wallman T5,

Abstract

OBJECTIVE:

The purpose of this study was to compare the effects of 3 different exercise approaches on neck muscle endurance (NME), kinesiophobia, exercise compliance, and patient satisfaction in patients with chronic whiplash.

METHODS:

This prospective randomized clinical trial included 216 individuals with chronic whiplash. Participants were randomized to 1 of 3 exercise interventions: neck-specific exercise (NSE), NSE combined with a behavioral approach (NSEB), or prescribed physical activity (PPA). Measures of ventral and dorsal NME (endurance time in seconds), perceived pain after NME testing, kinesiophobia, exercise compliance, and patient satisfaction were recorded at baseline and at the 3- and 6-month follow-ups.

RESULTS:

Compared with individuals in the prescribed physical activity group, participants in the NSE and NSEB groups exhibited greater gains in dorsal NME ($P = .003$), greater reductions in pain after NME testing ($P = .03$), and more satisfaction with treatment ($P < .001$). Kinesiophobia and exercise compliance did not significantly differ between groups ($P > .07$).

CONCLUSION:

Among patients with chronic whiplash, a neck-specific exercise intervention (with or without a behavioral approach) appears to improve NME. Participants were more satisfied with intervention including neck-specific exercises than with the prescription of general exercise.

Copyright © 2015 National University of Health Sciences. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

Exercise Therapy; Neck Pain; Rehabilitation; Whiplash Injuries

PMID: 26387858

13. CRANIUM/TMJ

Orthodontic pain

Am J Orthod Dentofacial Orthop. 2015 Oct;148(4):618-27. doi: 10.1016/j.ajodo.2015.04.037.

Effect of physical activity level on orthodontic pain perception and analgesic consumption in adolescents.

Sandhu SS¹, Sandhu J².

Abstract

INTRODUCTION:

The objective of this study was to assess the effect of baseline physical activity level on orthodontic pain perception and analgesic consumption after orthodontic separator placement in adolescents.

METHODS:

One hundred fifty participants (mean age, 14.5 years; SD, 1.7 years; 73 girls, 77 boys) were included in this longitudinal study. The physical activity questionnaire was used to assess their baseline physical activity levels. Once participants completed the questionnaire, orthodontic separators were placed at the mesial and distal contact points of the maxillary and mandibular first molars. A 100-mm visual analog scale was used for pain assessment. Analgesic consumption was recorded as a binary response (yes/no). Both outcomes were assessed at 1 baseline time point and 7 follow-up time points (bedtime on days 1 to 7). A multilevel mixed-effect model analysis approach was used to analyze the longitudinal data.

RESULTS:

Of the 150 participants in the study, data from 137 were included in the analysis (mean age, 14.4 years; SD, 1.7 years; 65 girls, 72 boys). Compared with the low-activity group (84 participants; 61.3%), the high-activity group (53 participants; 38.7%) experienced significantly less pain (mean estimate, -8.958; $P = 0.0114$; 95% confidence interval, -15.868 to -2.049) and consumed fewer analgesics (odds ratio, 0.443; $P < 0.0318$; 95% confidence interval, 0.199 to 0.786) during the study period.

CONCLUSIONS:

Physical activity has a significant influence on orthodontic pain perception and analgesic consumption in adolescents undergoing orthodontic treatment. Further research is needed on this topic to elucidate the association between physical activity and orthodontic pain.

Copyright © 2015 American Association of Orthodontists. Published by Elsevier Inc. All rights reserved.

PMID: 26432317

14. HEADACHES

HA and dementia

Headache as a predictor for dementia: The HUNT Study

The Journal of Headache and Pain, 10/16/2015 Røttereng AKS, et al.

The impact of headache on dementia is largely unknown. This study examined the association between headache and dementia using data from a large population-based study. Compared to the reference group, individuals with dementia were more likely to report non-previous migrainous headache in HUNT2, whereas a sample of confirmed non-demented were less likely to report previous non-migrainous headache.

Methods

- This population-based study used data from the Nord-Trøndelag Health Surveys performed in 1995–1997 (HUNT2) and 2006–2008 (HUNT3).
- The reference group (controls) was participants aged ≥ 55 years who answered the headache questions in HUNT2 and later participated in HUNT3 (n=15,601).
- The association with headache status in HUNT2 was investigated in sample of confirmed non-demented elderly evaluated with psychometric tests after HUNT3 (n=96), and HUNT2 participants later diagnosed with dementia during 1997–2011 (n=746).
- The association with headache was evaluated by logistical regression with adjustment for age, gender, level of education, comorbidity, smoking, and anxiety and depression.

Results

- Any headache was more likely to be reported in HUNT2 among those who later were included in the dementia registry (OR 1.24; 95 % CI 1.04–1.49) compared to the reference group, but less likely among the confirmed non-demented individuals (OR 0.62; 95 % CI 0.39–0.98).
- This relationship was even stronger for non-migrainous headache, whereas such association was not found for migraine.

Allergies and HA

Int Forum Allergy Rhinol. 2015 Oct 7. doi: 10.1002/alr.21654.

Allergic rhinitis and associated risk of migraine among children: a nationwide population-based cohort study.

Wang IC1, Tsai JD2,3, Lin CL4,5, Shen TC6,7, Li TC5, Wei CC1,7.

Abstract

BACKGROUND:

Increased frequency of migraine was reported in adults with allergic rhinitis (AR). Although migraine is less common in children than in adults, it can begin in early childhood and persist into adulthood. We conducted this population-based cohort study to investigate the incidence and subsequent risk of migraine in children with AR.

METHODS:

From 2000 to 2007, 461,850 children with recently diagnosed AR and 460,718 non-AR controls were included in the study. By the end of 2008, incidences of migraine in both cohorts, the AR to non-AR cohort hazard ratios (HRs), and confidence intervals (CIs) were measured.

RESULTS:

The incidence of migraine during the study period was 3.2-fold higher in the AR cohort (95% CI, 2.97 to 3.46) than in the non-AR cohort (11.4 vs 3.49 per 10000 person-years). The risk was greater for boys than for girls, and for children aged <6 years. The HR for migraine in children with AR was 1.44 (95% CI, 1.31 to 1.58) for those with ≤ 2 annual AR-related medical visits, whereas, 14.8 (95% CI, 13.6 to 16.2) for those with >4 visits ($p < 0.0001$, the trend test). The risk of migraine development in the AR cohort was highest within the first year after AR diagnosis (HR 4.89; 95% CI, 3.98 to 6.00). Children with AR were more likely to have migraine without aura than migraine with aura.

CONCLUSION:

Children with AR had a higher incidence and subsequent risk of migraine. Physicians should be more aware of migraine in children with AR who complain of headache.

© 2015 ARS-AAOA, LLC.

KEYWORDS:

allergic rhinitis; children; cohort study; confidence intervals; hazard ratios; migraine

PMID: 2644637

19. GLENOHUMERAL/SHOULDER**Shoulder pain poor outcomes**

BMC Musculoskelet Disord. 2015 Oct 9;16(1):288. doi: 10.1186/s12891-015-0738-4.

Pain intensity, neck pain and longer duration of complaints predict poorer outcome in patients with shoulder pain - a systematic review.

Kooijman MK¹, Barten DJ², Swinkels IC³, Kuijpers T⁴, de Bakker D^{5,6}, Koes BW⁷, Veenhof C⁸.

Abstract

BACKGROUND:

Shoulder complaints are common and have an unfavourable prognosis in many patients. Prognostic information is helpful for both patients and clinicians in managing the complaints. The research question was which factors have prognostic value on (un)favourable outcome in patients with shoulder complaints in primary care, secondary care and occupational settings.

METHODS:

Update of a systematic review in primary care, secondary care and occupational settings.

RESULTS:

Nine articles were published since the original review in 2004. Six were of high quality covering a wide variety of prognostic factors and outcome measures. Four studies were conducted in primary care settings. A best evidence synthesis, including the results of the previous systematic review on this topic shows that there is strong evidence that higher shoulder pain intensity, concomitant neck pain and a longer duration of symptoms predict poorer outcome in primary care settings. In secondary care populations, strong evidence was found for the association between greater disability and poorer outcome and between the existence of previous shoulder pain and poorer outcome.

CONCLUSION:

Clinicians may take these factors into account in the management of their patients. Those with a worse prognosis may be monitored more frequently and the treatment plan modified if complaints persist.

PMID: 26453452

Champaign toast position

J Shoulder Elbow Surg. 2015 Oct 3. pii: S1058-2746(15)00412-7. doi: 10.1016/j.jse.2015.07.031.

The champagne toast position isolates the supraspinatus better than the Jobe test: an electromyographic study of shoulder physical examination tests.

Chalmers PN¹, Cvetanovich GL², Kupfer N², Wimmer MA², Verma NN², Cole BJ², Romeo AA², Nicholson GP².

Abstract

BACKGROUND:

While Jobe's test is widely used, it does not isolate supraspinatus activity. Our purpose was to examine the electromyographic (EMG) activity within the supraspinatus and deltoid with resisted abduction to determine the shoulder position that best isolates the activity of the supraspinatus.

METHODS:

We performed EMG analysis of the supraspinatus, anterior head of the deltoid, and middle head of the deltoid in 10 normal volunteers. We measured EMG activity during resisted shoulder abduction in the scapular plane to both manual resistance and a standardized load in varying degrees of abduction and rotation. To determine which position best isolates supraspinatus activity, the ratio of supraspinatus to deltoid activity (S:D) was calculated for each position. Results were analyzed with a repeated-measures analysis of variance with Bonferroni correction. The posterior deltoid was excluded as it serves mostly to extend and externally rotate.

RESULTS:

Our study confirmed Jobe's findings of maximal supraspinatus activity at 90° of abduction. However, decreasing abduction significantly increased S:D for both resisted manual testing and testing against a standardized load ($P = .002$ and $.001$, respectively). The greatest S:D ratio (4.6 ± 3.4 for standardized load testing) was seen at the "champagne toast" position, i.e., 30° of abduction, mild external rotation, 30° of flexion, and 90° of elbow flexion. The smallest ratio (0.8 ± 0.6) was seen at Jobe's position.

CONCLUSIONS:

Testing of abduction strength in the champagne toast position, i.e., 30° of abduction, mild external rotation, and 30° of flexion, better isolates the activity of the supraspinatus from the deltoid than Jobe's "empty can" position.

Copyright © 2015 Journal of Shoulder and Elbow Surgery Board of Trustees. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

Rotator cuff; deltoid; electromyography; shoulder physical examination; supraspinatus

PMID: 26443105

20 A. ROTATOR CUFF**Blood flow into cuff**

J Shoulder Elbow Surg. 2015 Sep 25. pii: S1058-2746(15)00388-2. doi: 10.1016/j.jse.2015.07.014.

Microvascular blood flow in normal and pathologic rotator cuffs.

Karthikeyan S¹, Griffin DR², Parsons N³, Lawrence TM⁴, Modi CS⁴, Drew SJ⁴, Smith CD⁵.

Abstract

BACKGROUND:

Microvascular blood flow in the tendon plays an important role in the pathogenesis of rotator cuff abnormalities. There are conflicting views about the presence of a hypovascular zone in the supraspinatus tendon. Besides, no studies have looked at the pattern of blood flow around a partial-thickness tear. Our aim was to measure microvascular blood flow in normal and a range of pathologic rotator cuff tendons using laser doppler flowmetry.

METHODS:

A total of 120 patients having arthroscopic shoulder surgery were divided into 4 equal groups on the basis of their intraoperative diagnosis: normal rotator cuff, subacromial impingement syndrome, and partial-thickness or full-thickness rotator cuff tear. Microvascular blood flow was measured at 5 different regions of each cuff using a laser doppler probe. The values were compared to assess variability within and between individuals.

RESULTS:

Total blood flow was greater in the normal rotator cuff group compared with the groups with pathologic rotator cuffs, with the largest difference seen in the subacromial impingement group. Within individuals, blood flow was highest at the musculotendinous junction and lowest at the lateral insertional part of the tendon. Among groups, the blood flow was significantly lower at the anteromedial and posteromedial cuff in the groups with impingement and full-thickness tears compared with the group with normal cuff.

CONCLUSION:

Real-time in vivo laser doppler analysis has shown that microvascular blood flow is not uniform throughout the supraspinatus tendon. Blood flow in the pathologic supraspinatus tendon was significantly lower compared with the normal tendon.

Copyright © 2015 Journal of Shoulder and Elbow Surgery Board of Trustees. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

Rotator cuff; blood flow; critical zone; cuff tear; impingement; laser doppler flowmetry; microvascular; supraspinatus

PMID: 26412209

22 A. IMPINGEMENT**Shoulder exercise**

Man Ther. 2015 Oct;20(5):646-56. doi: 10.1016/j.math.2015.03.013. Epub 2015 Apr 1.

Is exercise effective for the management of subacromial impingement syndrome and other soft tissue injuries of the shoulder? A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration.

Abdulla SY1, Southerst D2, Côté P3, Shearer HM4, Sutton D4, Randhawa K4, Varatharajan S4, Wong JJ5, Yu H4, Marchand AA1, Chrobak K1, Woitzik E1, Shergill Y6, Ferguson B1, Stupar M4, Nordin M7, Jacobs C8, Mior S9, Carroll LJ10, van der Velde G11, Taylor-Vaisey A12.

Abstract

BACKGROUND:

Exercise is a key component of rehabilitation for soft tissue injuries of the shoulder; however its effectiveness remains unclear.

OBJECTIVE:

Determine the effectiveness of exercise for shoulder pain.

METHODS:

We searched seven databases from 1990 to 2015 for randomized controlled trials (RCTs), cohort and case control studies comparing exercise to other interventions for shoulder pain. We critically appraised eligible studies using the Scottish Intercollegiate Guidelines Network (SIGN) criteria. We synthesized findings from scientifically admissible studies using best-evidence synthesis methodology.

RESULTS:

We retrieved 4853 articles. Eleven RCTs were appraised and five had a low risk of bias. Four studies addressed subacromial impingement syndrome. One study addressed nonspecific shoulder pain. For variable duration subacromial impingement syndrome: 1) supervised strengthening leads to greater short-term improvement in pain and disability over wait listing; and 2) supervised and home-based strengthening and stretching leads to greater short-term improvement in pain and disability compared to no treatment. For persistent subacromial impingement syndrome: 1) supervised and home-based strengthening leads to similar outcomes as surgery; and 2) home-based heavy load eccentric training does not add benefits to home-based rotator cuff strengthening and physiotherapy. For variable duration low-grade nonspecific shoulder pain, supervised strengthening and stretching leads to similar short-term outcomes as corticosteroid injections or multimodal care.

CONCLUSION:

The evidence suggests that supervised and home-based progressive shoulder strengthening and stretching are effective for the management of subacromial impingement syndrome. For low-grade nonspecific shoulder pain, supervised strengthening and stretching are equally effective to corticosteroid injections or multimodal care. **KEYWORDS:** Exercise; Shoulder pain; Subacromial impingement syndrome; Systematic review PMID: 25920340

24. ELBOW

Axis rotation

J Shoulder Elbow Surg. 2015 Sep 26. pii: S1058-2746(15)00376-6. doi: 10.1016/j.jse.2015.07.002.

In vivo three-dimensional elbow biomechanics during forearm rotation.

Omori S¹, Miyake J¹, Oka K¹, Tanaka H¹, Yoshikawa H¹, Murase T².

Abstract

BACKGROUND:

It is unclear how elbow kinematics changes during forearm rotation. This study investigated in vivo 3-dimensional elbow kinematics during forearm rotation.

METHODS:

We studied 12 normal elbows using in vivo 3-dimensional computed tomography data in maximum forearm supination, neutral, and maximum pronation with the elbows in extension. We measured the motion of the radius and ulna relative to the humerus using a markerless bone registration technique and the contact area of the radiocapitellar joint, proximal radioulnar joint, and ulnohumeral joint using a proximity mapping method.

RESULTS:

When the forearm rotated from the supinated position to the pronated position, the radius showed significant varus rotation, internal rotation, and extension relative to the humerus. The center of the radial head significantly translated anteriorly, proximally, and laterally. The ulna significantly rotated in valgus, and the deepest point on the sagittal ridge of the trochlear notch translated medially with forearm pronation. The contact area of the radiocapitellar joint was largest in pronation. The contact area of the proximal radioulnar joint was largest in supination. The contact area of the ulnohumeral joint showed no significant change during forearm rotation.

CONCLUSIONS:

In pronation, because of the proximal migration of the radial head, the radiocapitellar joint was most congruent compared with other positions. The proximal radioulnar joint was most congruent in supination. The ulnohumeral joint congruency was not affected by forearm rotation. This study provides useful information for understanding 3-dimensional elbow motion and joint osseous stability related to forearm rotation.

Copyright © 2015 Journal of Shoulder and Elbow Surgery Board of Trustees. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

3-Dimensional biomechanics; elbow joint; forearm rotation; in vivo

PMID: 26422527

26. CARPAL TUNNEL SYNDROME**Computer work not strongly associated with CTS**

BMJ Open. 2015 Sep 9;5(9):e008156. doi: 10.1136/bmjopen-2015-008156.

Carpal tunnel syndrome and computer exposure at work in two large complementary cohorts.

Mediouni Z¹, Bodin J², Dale AM³, Herquelot E⁴, Carton M⁴, Leclerc A⁵, Fouquet N⁶, Dumontier C⁷, Roquelaure Y⁸, Evanoff BA³, Descatha A⁹.

Abstract

OBJECTIVES:

The boom in computer use and concurrent high rates in musculoskeletal complaints and carpal tunnel syndrome (CTS) among users have led to a controversy about a possible link. Most studies have used cross-sectional designs and shown no association. The present study used longitudinal data from two large complementary cohorts to evaluate a possible relationship between CTS and the performance of computer work.

SETTINGS AND PARTICIPANTS:

The Cosali cohort is a representative sample of a French working population that evaluated CTS using standardised clinical examinations and assessed self-reported computer use. The PrediCTS cohort study enrolled newly hired clerical, service and construction workers in several industries in the USA, evaluated CTS using symptoms and nerve conduction studies (NCS), and estimated exposures to computer work using a job exposure matrix.

PRIMARY AND SECONDARY OUTCOME MEASURES:

During a follow-up of 3-5 years, the association between new cases of CTS and computer work was calculated using logistic regression models adjusting for sex, age, obesity and relevant associated disorders.

RESULTS:

In the Cosali study, 1551 workers (41.8%) completed follow-up physical examinations; 36 (2.3%) participants were diagnosed with CTS. In the PrediCTS study, 711 workers (64.2%) completed follow-up evaluations, whereas 31 (4.3%) had new cases of CTS. The adjusted OR for the group with the highest exposure to computer use was 0.39 (0.17; 0.89) in the Cosali cohort and 0.16 (0.05; 0.59) in the PrediCTS cohort.

CONCLUSIONS:

Data from two large cohorts in two different countries showed no association between computer work and new cases of CTS among workers in diverse jobs with varying job exposures. CTS is far more common among workers in non-computer related jobs; prevention efforts and work-related compensation programmes should focus on workers performing forceful hand exertion.

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>.

KEYWORDS:

EPIDEMIOLOGY; OCCUPATIONAL & INDUSTRIAL MEDICINE; PUBLIC HEALTH; RHEUMATOLOGY

PMID: 26353869

30 A. IMPINGEMENT**Instability**

Arthroscopy. 2015 Sep 27. pii: S0749-8063(15)00646-5. doi: 10.1016/j.arthro.2015.07.021.

Does Femoroacetabular Impingement Cause Hip Instability? A Systematic Review.

Canham CD¹, Yen YM², Giordano BD³.

Abstract

PURPOSE:

To determine whether femoroacetabular impingement (FAI) is associated with hip instability.

METHODS:

A systematic search examining FAI and hip instability was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Clinical and basic science studies were included. Instability had to be documented with either a clinical or imaging examination. Studies were excluded if they did not define diagnostic criteria for FAI, involved prosthetic hips, were not in English, were review articles, or reported Level V evidence (case reports, expert opinion). Rates of FAI morphologic features in patients with documented hip instability were determined. Mechanisms and rates of FAI-induced hip subluxation were examined in basic science studies.

RESULTS:

The search yielded 1,630 relevant studies. Seven studies (4 clinical and 3 basic science) met inclusion criteria. Four studies investigated an association between FAI and hip instability in 92 patients with an average age of 31 years. Seventy-six patients experienced frank dislocations and 16 experienced posterior subluxation events. The prevalence of FAI was documented in 89 patients with hip instability. The rates of cam and pincer morphologic characteristics were 74% and 64%, respectively. The average lateral center edge angle and prevalence of acetabular retroversion were 30° and 70%, respectively (n = 76 patients). All 3 basic science studies had real-time visualization of FAI-induced hip subluxations.

CONCLUSIONS:

High rates of FAI morphologic characteristics are present in patients with hip instability. FAI morphologic characteristics may predispose the hip to instability through anatomic conflict caused by pincer or cam lesions (or both) levering the femoral head posteriorly.

LEVEL OF EVIDENCE:

Level IV, systematic review of Level III, Level IV, and non-clinical studies.

Copyright © 2015 Arthroscopy Association of North America. Published by Elsevier Inc. All rights reserved.

PMID: 26427629

Pathomechanics of CAM impingement's and squatting

Clin Biomech (Bristol, Avon). 2015 Sep 25. pii: S0268-0033(15)00257-0. doi: 10.1016/j.clinbiomech.2015.09.016.

Hip kinematics and kinetics in persons with and without cam femoroacetabular impingement during a deep squat task.

Bagwell JJ1, Snibbe J2, Gerhardt M3, Powers CM4.

Abstract

BACKGROUND:

Previous studies have indicated that hip and pelvis kinematics may be altered during functional tasks in persons with femoroacetabular impingement. The purpose of this study was to compare hip and pelvis kinematics and kinetics during a deep squat task between persons with cam femoroacetabular impingement and pain-free controls.

METHODS:

Fifteen persons with cam femoroacetabular impingement and 15 persons without cam femoroacetabular impingement performed a deep squat task. Peak hip flexion, abduction, and internal rotation, and mean hip extensor, adductor, and external rotator moments were quantified. Independent t-tests ($\alpha < 0.05$) were used to evaluate between group differences.

FINDINGS:

Compared to the control group, persons with cam femoroacetabular impingement demonstrated decreased peak hip internal rotation (15.2° (SD 9.5°) vs. 9.4° (SD 7.8°); $P=0.041$) and decreased mean hip extensor moments (0.56 (SD 0.12) Nm/kg vs. 0.45 (SD 0.15) Nm/kg; $P=0.018$). In addition persons in the cam femoroacetabular impingement group demonstrated decreased posterior pelvis tilt during squat descent compared to the control group, resulting in a more anteriorly tilted pelvis at the time peak hip flexion (12.5° (SD 17.1°) vs. 23.0° (SD 12.4°); $P=0.024$).

INTERPRETATION:

The decreased hip internal rotation observed in persons with cam femoroacetabular impingement may be the result of bony impingement. Furthermore, the decrease in posterior pelvis tilt may contribute to impingement by further approximating the femoral head-neck junction with the acetabulum. Additionally, decreased hip extensor moments suggest that diminished hip extensor muscle activity may contribute to decreased posterior pelvis tilt.

Copyright © 2015 Elsevier Ltd. All rights reserved.

KEYWORDS:

Femoroacetabular impingement; Hip; Kinematics; Kinetics; Pelvis; Squat

PMID: 26432415

32 A. KNEE/ACL**ACL helped with training**

Br J Sports Med. 2015 Sep 23. pii: bjsports-2015-094776. doi: 10.1136/bjsports-2015-094776.

Effects of evidence-based prevention training on neuromuscular and biomechanical risk factors for ACL injury in adolescent female athletes: a randomised controlled trial.

Zebis MK1, Andersen LL2, Brandt M3, Myklebust G4, Bencke J5, Lauridsen HB5, Bandholm T6, Thorborg K7, Hölmich P7, Aagaard P8.

Abstract

BACKGROUND:

Adolescent female football and handball players are among the athletes with the highest risk of sustaining anterior cruciate ligament (ACL) injuries.

AIM:

This study evaluated the effects of evidence-based lower extremity injury prevention training on neuromuscular and biomechanical risk factors for non-contact ACL injury.

METHODS:

40 adolescent female football and handball players (15-16 years) were randomly allocated to a control group (CON, n=20) or neuromuscular training group (NMT, n=20). The NMT group performed an injury prevention programme as a warm-up before their usual training 3 times weekly for 12 weeks. The CON group completed their regular warm-up exercise programme before training. Players were tested while performing a side cutting movement at baseline and 12-week follow-up, using surface electromyography (EMG) and three-dimensional movement analysis. We calculated: (1) EMG amplitude from vastus lateralis (VL), semitendinosus (ST) and biceps femoris 10 ms prior to initial contact (IC) normalised to peak EMG amplitude recorded during maximal voluntary isometric contraction and (2) VL-ST EMG preactivity difference during the 10 ms prior to foot contact (primary outcome). We measured maximal knee joint valgus moment and knee valgus angle at IC.

RESULTS:

There was a difference between groups at follow-up in VL-ST preactivity (43% between-group difference; 95% CI 32% to 55%). No between-group differences were observed for kinematic and kinetic variables.

CONCLUSIONS:

A 12-week injury prevention programme in addition to training and match play in adolescent females altered the pattern of agonist-antagonist muscle preactivity during side cutting. This may represent a more ACL-protective motor strategy.

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>.

KEYWORDS:

ACL; Adolescent; Athlete; Biomechanics; Training

PMID: 26400955

Return to sports

Br J Sports Med. 2015 Oct;49(20):1295-304. doi: 10.1136/bjsports-2014-094089. Epub 2015 Jun 10.

After revision anterior cruciate ligament reconstruction, who returns to sport? A systematic review and meta-analysis.

Grassi A¹, Zaffagnini S¹, Marcheggiani Muccioli GM¹, Neri MP¹, Della Villa S², Marcacci M¹.

Abstract

BACKGROUND:

Return to sport and to pre-injury level represents an important outcome after both primary and revision anterior cruciate ligament (ACL) reconstructions.

PURPOSE:

The aim of the present meta-analysis was to determine the return to sport rate after revision ACL reconstruction.

MATERIAL AND METHODS:

A systematic search was performed of the MEDLINE, Embase and the Cochrane Central Register of Controlled Trials Databases. All the studies that reported return to sport, return to pre-injury sport level and return to high level/competitive sport was considered for the meta-analysis. The overall pooled mean of post-operative knee laxity and pooled rate of positive pivot-shift and objective International Knee Documentation Committee (IKDC) categories was calculated as well.

RESULTS:

Overall, 472 abstracts were identified and screened for inclusion and only 16 studies reported the rate of return to any level of sport activity at the final follow-up of 4.7 years (range 1.0-13.2 years), showing a pooled rate of 85.3% (CI 79.7 to 90.2). The return to pre-injury sport level was achieved in 53.4% (CI 37.8 to 68.7) of cases. Normal or quasi-normal objective IKDC, less than 5 mm of side-to-side difference at arthrometric evaluations and grade I-II pivot-shift test were reported in 84%, 88% and 93% patients, respectively.

CONCLUSIONS:

In spite of almost 8 patients out of 10 returning to sport after revision ACL reconstruction and showing good stability, only half of the patients returned to the same pre-injury sport level.

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>.

KEYWORDS:

ACL; Knee; Review; Sport

PMID: 26062956

34. PATELLA**Patella taping decreases pain**

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

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

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

Abstract

Numerous athletes with patellar tendinopathy (PT) use a patellar strap or sports tape during sports. This study's aim was to investigate the short-term effect of these orthoses on patellar tendon pain. Participants performed the single-leg decline squat, vertical jump test, and triple-hop test under four different conditions (patellar strap, sports tape, placebo, and control). Subsequently, participants practiced sports as usual for 2 weeks; during 1 week, they were assigned to one of the four conditions. Pain was measured with the visual analog scale (VAS). In total, 97 athletes with PT [61% male, age 27.0 (SD8.1), VISA-P 58.5 (SD12.7)] were analyzed. On the single-leg decline squat, the VAS pain score reduced significantly in the patellar strap (14 mm, $P = 0.04$) and the sports tape condition (13 mm, $P = 0.04$), compared with control, but not placebo. A significant decrease in VAS pain during sports was found in the sports tape (7 mm, $P = 0.04$) and placebo group (6 mm, $P = 0.04$). The VAS pain score two hours after sports decreased significantly in the patellar strap, sports tape and placebo group (8-mm, $P < 0.001$, 10 mm, $P = 0.001$ and 7 mm, $P = 0.03$, respectively).

This study's findings indicate that an orthosis (including placebo tape) during sports can reduce pain in PT patients in the short term.

© 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

KEYWORDS:

Jumper's knee; brace; patellar tendon; prevention

PMID: 26376953

Patellar tendiopathy

J Orthop Sports Phys Ther. 2015 Sep 21:1-36.

Rehabilitation of Patellar Tendinopathy Using Hip Extensors Strengthening and Landing Strategy Modification: Case Report With 6-Months Follow-Up.

Silva RS1, Ferreira AL, Nakagawa TH, Santos JE, Serrão FV.

Abstract

Study Design Case report. **Background** Although eccentric exercises have been a cornerstone for the rehabilitation of athletes with patellar tendinopathy, the effectiveness of this intervention is sometimes less than ideal. Athletes with patellar tendinopathy have been shown to have different jump-landing patterns and lower hip extensor strength compared to asymptomatic athletes. To our knowledge, the effectiveness of an intervention addressing these impairments has not yet been investigated. **Case Description** The patient was a 21-years-old male volleyball athlete with a 9-month history of patellar tendon pain. Pain was measured with a visual analogue scale. Disability was measured with the Victorian Institute of Sport Assessment-Patella questionnaire. These assessments were conducted before and after an 8-week intervention, as well as 6 months post-intervention. Hip and knee kinematics and kinetics during drop vertical jump and isometric strength were also measured before and after the intervention at 8 weeks. The intervention consisted of hip extensor muscles strengthening and jump-landing strategy modification training. The patient did not interrupt volleyball practice/competition during rehabilitation. **Outcomes** After the 8-week intervention and at 6 months post-intervention, the athlete was completely asymptomatic during sports participation. This favorable clinical outcome was accompanied by a 50% increase in hip extensor moment, a 21% decrease in knee extensor moment, and a 26% decrease in patellar tendon force during jump-landing measured at 8 weeks. **Discussion** An 8-week intervention of hip muscles strengthening and jump-landing modification decreased pain and disability and improved jump-landing biomechanics in an athlete with patellar tendinopathy.

Level of Evidence Therapy, level 4. J Orthop Sports Phys Ther, Epub 21 Sep 2015.
doi:10.2519/jospt.2015.6242.

KEYWORDS:

biomechanics; jumper's knee; overuse; tendon; volleyball

PMID: 26390271

35. KNEE/TOTAL**Preexisting central sensitization and TK**

Osteoarthritis Cartilage. 2015 Sep 14. pii: S1063-4584(15)01314-X. doi: 10.1016/j.joca.2015.09.002.

Does pre-surgical central modulation of pain influence outcome after total knee replacement? A systematic review.

Baert IA¹, Lluch E², Mulder T³, Nijs J⁴, Noten S⁵, Meeus M⁶.

Abstract

The aim of this study is to systematically review whether the presence of altered central pain modulation pre-surgical influences outcome after total knee replacement (TKR) in patients with knee osteoarthritis (OA), and if so which indices of central pain modulation predict poor outcome after TKR.

To identify relevant articles, PubMed and Web of Science were searched. The search strategy was a combination of key words related to "Knee Osteoarthritis and Total Knee Replacement", "Central Pain Modulation" and "Post-Surgical Outcome Measures". Articles fulfilling the inclusion criteria were screened for methodological quality and results were analyzed and summarized. Sixteen prospective cohort studies were included. Strong evidence is available that presence of catastrophic thinking and poor coping strategies predict more pain after TKR and that there is no association between fear of movement and post-surgical pain or function. Evidence on other psychosocial influences is limited or conflicting. Literature on the influence of other signs of altered central pain modulation on post-surgical outcome is scarce. It is plausible that pre-surgical signs of altered central pain modulation, such as joint pain at rest or widespread pain sensitization, predict more post-surgical pain.

Surgeons should be attentive for patients with signs of altered central pain modulation before surgery as they might be at risk for unfavorable outcome. A broader therapeutic approach aiming to desensitize the central nervous system can be adapted in these patients. Further research is however needed to identify the influence of central pain modulation pre-surgical in predicting outcome after TKR.

Copyright © 2015 Osteoarthritis Research Society International. Published by Elsevier Ltd. All rights reserved.

KEYWORDS:

Central pain modulation; Knee osteoarthritis; Post-surgical outcomes; Systematic review; Total knee replacement

PMID: 26382109

Total Knee type of exercise

J Geriatr Phys Ther. 2015 Sep 30.

High-Velocity Quadriceps Exercises Compared to Slow-Velocity Quadriceps Exercises Following Total Knee Arthroplasty: A Randomized Clinical Study.

Doerfler D1, Gurney B, Mermier C, Rauh M, Black L, Andrews R.

Abstract

BACKGROUND AND PURPOSE:

Despite improvement in pain and perceived function in older adults following total knee arthroplasty (TKA), objective outcome measures of muscular impairment and ambulatory function demonstrate significant deficits. Evidence suggests that quadriceps power may play a greater role in ambulatory function than measures of strength alone following TKA. The purpose of this study was to compare the effect of high-velocity (HV) quadriceps exercises with that of slow-velocity (SV) quadriceps exercises on functional outcomes and quadriceps power following TKA.

METHODS:

This study was a randomized clinical study conducted in an outpatient physical therapy clinic. Twenty-one participants who were 4 to 6 weeks out from a unilateral TKA were randomly assigned to an HV or SV group. Participants performed an evidence-based standardized progressive resistance exercise program in addition to HV quadriceps exercises or SV quadriceps exercises. Participants attended 2 sessions per week for 8 weeks. Before and after the 8-week exercise intervention, participants completed a functional questionnaire, health survey, functional testing, and underwent quadriceps strength and power testing.

RESULTS:

Both groups demonstrated improvements in ambulatory outcome measures, strength, speed, and power. The HV group demonstrated significantly greater improvements in distance walked and quadriceps strength than the SV group.

LIMITATIONS:

These data should be considered preliminary because of a small sample size.

CONCLUSION:

HV quadriceps exercises may be an effective rehabilitation strategy in conjunction with a standardized progressive resistance exercise program beginning 4 to 6 weeks after TKA.

PMID: 26428903

37. OSTEOARTHRITIS/KNEE**Knee OA conservative care**

Acta Orthop. 2015 Oct;86(5):599-604. doi: 10.3109/17453674.2015.1029392.

Nonoperative treatment improves pain irrespective of radiographic severity.

Skou ST1,2, Derosche CA1, Andersen MM3, Rathleff MS2, Simonsen O1.

Abstract

Background and purpose - The discrepancy between symptoms and radiographic severity of knee osteoarthritis (OA) is well described. However, little is known about whether radiographic severity is predictive of the clinical result of nonoperative treatment. We investigated whether radiographic severity and treatment type were associated with improvements in pain after nonoperative treatment of patients with knee OA.

Patients and methods - A 5-year consecutive series of patients deemed not eligible for total knee arthroplasty (TKA) by an experienced orthopedic surgeon was contacted 1-5 years later. Radiographic severity, age, sex, and BMI were registered at the consultation. At follow-up, patients were asked to answer a questionnaire on type of treatment and improvements in pain after treatment.

Results - Of 1,848 patients who were not eligible for TKA, 1,414 (77%) completed the follow-up questionnaire (mean age 66 (24-96) years; 55% women). Radiographic severity was not associated with improvements in pain even after adjusting for treatment type, age, sex, and BMI ($p > 0.1$). The odds ratio of improvement was higher by a factor of 2 in patients who received physiotherapy or multimodal treatment than in patients who did not.

Interpretation - Radiographic severity was not associated with improvements in pain after nonoperative treatment. Patients who are not eligible for TKA can confidently be referred to nonoperative treatment even if they have severe radiographic OA. The treatment should preferably be multimodal, including physiotherapy, as recommended in Danish and international clinical guidelines.

PMID: 25765729

40. ANKLE SPRAINS AND INSTABILITY**Ankle instability and balance deficits**

Hum Mov Sci. 2015 Oct;43:33-44. doi: 10.1016/j.humov.2015.07.001. Epub 2015 Jul 15.

Individuals with chronic ankle instability compensate for their ankle deficits using proximal musculature to maintain reduced postural sway while kicking a ball.

Rios JL1, Gorges AL1, Dos Santos MJ2.

Abstract

The aim of this study was to investigate anticipatory (APA), simultaneous (SPA) and compensatory (CPA) postural adjustments in individuals with and without chronic ankle instability (CAI) as they kicked a ball while standing in a single-leg stance on a stable and unstable surface.

Electromyographic activity (EMG) of postural muscles and center of pressure (COP) displacements were calculated and their magnitudes analyzed during the postural adjustment intervals. Additionally, the COP area of sway was calculated over the duration of the whole task. The activities of postural muscles were also studied using principal component analysis (PCA) to identify between-group differences in patterns of muscle activation. The individuals with CAI showed reduced magnitude of EMG at the muscles around the ankle while around the hip the activity was increased. These were associated with a reduction in balance sway across the entire task, as compared with the control group. The PCA revealed that CAI participants assemble different sets of muscle activation to compensate for their ankle instability, primarily activating hip/spine muscles.

These results set up potential investigations to examine whether balance control interventions enhance these adaptations or revert them to a normal pattern as well as if any of these changes proactively address recurrent ankle sprain conditions.

Published by Elsevier B.V.

KEYWORDS:

Anticipatory adjustments; Compensatory; Reactive responses; Recurrent sprain; Rehabilitation

PMID: 26189152

42. PLANTAR SURFACE

Plantar fasciitis and weight bearing patterns

PLoS One. 2015 Sep 16;10(9):e0136971. doi: 10.1371/journal.pone.0136971. eCollection 2015.

Dynamic Patterns of Forces and Loading Rate in Runners with Unilateral Plantar Fasciitis: A Cross-Sectional Study.

Ribeiro AP1, João SM2, Dinato RC2, Tessutti VD2, Sacco IC2.

Abstract

AIM/HYPOTHESIS:

The etiology of plantar fasciitis (PF) has been related to several risk factors, but the magnitude of the plantar load is the most commonly described factor. Although PF is the third most-common injury in runners, only two studies have investigated this factor in runners, and their results are still inconclusive regarding the injury stage.

OBJECTIVE:

Analyze and compare the plantar loads and vertical loading rate during running of runners in the acute stage of PF to those in the chronic stage of the injury in relation to healthy runners.

METHODS:

Forty-five runners with unilateral PF (30 acute and 15 chronic) and 30 healthy control runners were evaluated while running at 12 km/h for 40 meters wearing standardized running shoes and Pedar-X insoles. The contact area and time, maximum force, and force-time integral over the rearfoot, midfoot, and forefoot were recorded and the loading rate (20-80% of the first vertical peak) was calculated. Groups were compared by ANOVAs ($p < 0.05$).

RESULTS:

Maximum force and force-time integral over the rearfoot and the loading rate was higher in runners with PF (acute and chronic) compared with controls ($p < 0.01$). Runners with PF in the acute stage showed lower loading rate and maximum force over the rearfoot compared to runners in the chronic stage ($p < 0.01$).

CONCLUSION:

Runners with PF showed different dynamic patterns of plantar loads during running over the rearfoot area depending on the injury stage (acute or chronic). In the acute stage of PF, runners presented lower loading rate and forces over the rearfoot, possibly due to dynamic mechanisms related to pain protection of the calcaneal area.

PMID: 26375815

Heel pain

J Ultrasound Med. 2015 Oct;34(10):1861-71. doi: 10.7863/ultra.14.12073. Epub 2015 Sep 11.

Sonographic Evaluation of the Plantar Heel in Asymptomatic Endurance Runners.

Hall MM¹, Finnoff JT², Sayeed YA², Smith J².

Abstract

OBJECTIVES:

The primary purpose of this investigation was to determine the prevalence and spectrum of asymptomatic sonographically determined structural changes in the plantar fascia and plantar heel pad among experienced runners without a history of heel pain.

METHODS:

Thirty-nine asymptomatic runners without a history of plantar heel pain were recruited. The following sonographic measures were recorded: power Doppler sonography in the plantar heel pad and plantar fascia, echo texture of the plantar heel pad, uncompressed heel pad thickness, compressed heel pad thickness, heel pad compressibility index, plantar fascia thickness, and plantar fascia echo texture.

RESULTS:

Doppler flow was shown in the plantar heel pads of 88% (68 of 77) of heels and 92% (36 of 39) of runners. Heel pad echo texture abnormalities were found in 86% (66 of 77) of heels and 97% (38 of 39) of runners. Mean values for right and left uncompressed heel pad thickness were 13.8 and 13.7 mm, respectively. The mean heel pad compressibility indices were 0.51 for the right heel and 0.53 for the left heel. Eight percent (6 of 77) of fat pads in 10% (4 of 39) of runners had abnormal compressibility indices. Doppler flow was present in the plantar fascia in 31% (24 of 77) of heels and 44% (17 of 39) of runners. The mean plantar fascia thicknesses were 3.78 mm for the right and 3.87 mm for the left. Forty-eight percent (37 of 77) of heels had an abnormal plantar fascia echo texture.

CONCLUSIONS:

At least 1 potentially abnormal sonographic finding was present in each heel of all asymptomatic runners in this study. Consequently, sonographic abnormalities in the plantar heel should be interpreted within the clinical context when evaluating runners.

© 2015 by the American Institute of Ultrasound in Medicine.

KEYWORDS:

foot; heel; musculoskeletal ultrasound; running; sonography

PMID: 26362149

Injections vs exercise and joint mob

Foot Ankle Int. 2015 Sep 23. pii: 1071100715607619

Joint Mobilization and Stretching Exercise vs Steroid Injection in the Treatment of Plantar Fasciitis: A Randomized Controlled Study.

Celik D¹, Kuş G², Sırma SÖ³.

Abstract

BACKGROUND:

This study compared the effectiveness of joint mobilization combined with stretching exercises (JM&Str) vs steroid injection (SI) in the treatment of plantar fasciitis (PF).

METHODS:

A total of 43 patients (mean age, 45.5 ± 8.5 years; range, 30-60 years; 23 females) with PF were randomly assigned to receive either JM&Str (n = 22) or SIs (n = 21). JM&Str was applied 3 times per week for 3 weeks for a total of 9 visits. The SI group received 1 injection at baseline. The patients' functional scores were assessed using the Foot and Ankle Ability Measure (FAAM), and pain was evaluated using the Visual Analog Scale (VAS). Outcomes of interest were captured at baseline and at 3-week, 6-week, 12-week, and 1-year follow-ups. The primary aim was examined using a mixed-model analysis of variance (ANOVA). Pairwise comparisons were performed to examine differences between the baseline and follow-up periods using Bonferroni equality at an alpha level of 0.05.

RESULTS:

Age, sex, body mass index, and dorsiflexion range of motion did not significantly impact pain relief or functional outcome ($P > .05$) at the 3-, 6- or 12-week follow-ups compared to baseline. Planned pairwise comparisons demonstrated significant improvements in pain relief and functional outcomes in both groups ($P < .05$) at the 3-, 6-, and 12-week follow-ups compared to baseline. However, at the 12-week and 1-year follow-ups, pain and functional outcomes were significantly improved in only the JM&Str group ($P = .002$). The overall group-by-time interaction was statistically significant for both FAAM ($P = .001$; $F = 7.0$) and VAS ($P = .001$; $F = 8.3$) scores. Between-group differences favored the SI group at the 3-week ($P = .001$, $P = .001$), 6-week ($P = .002$, $P = .001$), and 12-week ($P = .008$, $P = .001$) follow-ups for pain relief and functional outcomes. However, no significant differences ($P = .62$, $P = .57$) were detected in the measured outcomes at the 1-year follow-up.

CONCLUSION:

Our study demonstrated that while both groups achieved significant improvements at the 3-, 6-, and 12-week follow-ups, the SI group exhibited better outcomes at all 3 time points. The noted improvements continued in only the JM&Str group for a period of time ranging from 12 weeks to 1 year.

LEVEL OF EVIDENCE:

Level II, comparative study.

© The Author(s) 2015.

KEYWORDS:

exercise therapy; fascia; foot pain; manual therapy; pain management

PMID: 26400901

45 A. MANUAL THERAPY LUMBAR & GENERAL**McKenzie and MET combined work well**

Med Sci Monit. 2015 Sep 29;21:2918-32. doi: 10.12659/MSM.894261.

Impact of McKenzie Method Therapy Enriched by Muscular Energy Techniques on Subjective and Objective Parameters Related to Spine Function in Patients with Chronic Low Back Pain.

Szulc P1, Wendt M2, Waszak M1, Tomczak M3, Cieřlik K1, Trzaska T2.

Abstract

BACKGROUND The high incidence and inconsistencies in diagnostic and therapeutic process of low back pain (LBP) stimulate the continuing search for more efficient treatment modalities. Integration of the information obtained with various therapeutic methods and a holistic approach to the patient seem to be associated with positive outcomes. The aim of this study was to analyze the efficacy of combined treatment with McKenzie method and Muscle Energy Technique (MET), and to compare it with the outcomes of treatment with McKenzie method or standard physiotherapy in specific chronic lumbar pain.

MATERIAL AND METHODS The study included 60 men and women with LBP (mean age 44 years). The patients were randomly assigned to 1 of 3 therapeutic groups, which were further treated with: 1) McKenzie method and MET, 2) McKenzie method alone, or 3) standard physiotherapy for 10 days. The extent of spinal movements (electrogoniometry), level of experienced pain (Visual Analogue Scale and Revised Oswestry Pain Questionnaire), and structure of the spinal discs (MRI) were examined prior to the intervention, immediately thereafter, and 3 months after the intervention. **RESULTS** McKenzie method enriched with MET had the best therapeutic outcomes. The mobility of cervical, thoracic, and lumbar spine normalized at levels corresponding to 87.1%, 66.7%, and 95% of respective average normative values. Implementation of McKenzie method, both alone and combined with MET, was associated with a significant decrease in Oswestry Disability Index, significant alleviation of pain (VAS), and significantly reduced size of spinal disc herniation.

CONCLUSIONS The combined method can be effectively used in the treatment of chronic LBP.

PMID: 2641886

Lumbar instability tests**The inter-rater reliability of clinical tests that best predict the subclassification of lumbar segmental instability: structural, functional and combined instability**Faisal M. Alyazedi¹; Everett B. Lohman²; R. Wesley Swen²; Khaled Bahjri³**Volume 23, Issue 4 (September 2015), pp. 197-204**

Keywords: Clinical prediction rule, Low-back pain, Physical examination, Reliability, Segmental instability

DOI: <http://dx.doi.org/10.1179/2042618615Y.0000000002>

Abstract

Objectives:

This study investigated the inter-rater reliability of three structural end range lumbar segmental instability tests with the highest positive likelihood ratio (+ LR) against flexion–extension radiographs, and three functional mid-range clinical tests that predict the success of lumbar stabilisation exercises in patients with recurrent or chronic low-back pain (R/CLBP). The study also investigated the reliability of lumbar segmental instability, subclassification as: functional, structural and combined instability.

Method:

Forty adults with R/CLBP (30 men and 10 women), aged 21–71 years, underwent repeated measurements of specific clinical tests for structural or functional lumbar segmental instability.

Results:

All functional-instability tests: the prone instability test (PIT), the aberrant motion test and the average passive straight-leg raise (PSLR>91°) test showed a high percentage agreement (90, 97.5 and 95%, respectively) and a high kappa coefficient (0.71, 0.79 and 0.77, respectively). In addition, two structural tests: the lumbar flexion range of motion (ROM) >53° and the passive lumbar extension test (PLET) showed a high percentage agreement (82 and 73%, respectively), and a moderate kappa coefficient (0.48 and 0.46, respectively). The lack of hypomobility with the posteroanterior (PA) glide test was found to be unreliable (agreement = 25%; $k = -0.02$). Locating the pain-provoking segment, as the first portion of PIT, was found to be moderately reliable ($k = 0.41$). The subclassification categories of lumbar segmental instability (functional, structural and combined) were found to be significantly reliable (PABAK) 0.90, 0.70 and 0.95, respectively).

Discussion:

All investigated tests (except the lack of hypomobility with the PA glide test), in addition to subclassifying the categories of lumbar segmental instability, were significantly reliable in the assessment of lumbar instability.

Keywords: Clinical prediction rule, Low-back pain, Physical examination, Reliability, Segmental instability

MT for head and neck CA

Clin Otolaryngol. 2015 Sep 17. doi: 10.1111/coa.12535.

A novel manual therapy program during radiation therapy for head and neck cancer - our clinical experience with 5 patients.

Krisciunas GP1, Golan H1, Marinko LN2, Pearson W3, Jalisi S1, Langmore SE4.

Abstract

1. Manual therapy is typically used reactively as rehabilitation. It has not been used proactively during radiation therapy in the head and neck cancer population.
2. Manual therapy has the potential to reduce pain, inflammation, and contracture, so there is a rationale for using manual therapy proactively during head and neck cancer therapy.
3. Using our purpose built manual therapy protocol, all 5 patients experienced reductions in pain and 3/5 experienced improvement in mobility. There were no adverse outcomes.
4. Manual therapy would not be suitable for patients experiencing severe erythema, desquamation, or lymphedema.
5. A prospective controlled trial testing the efficacy of manual therapy for short term pain reduction and long term fibrosis outcomes is warranted. This article is protected by copyright. All rights reserved.

This article is protected by copyright. All rights reserved.

PMID: 26381894

45 B. MANUAL THERAPY CERVICAL**Neck pain integrated treatment program**

Am J Phys Med Rehabil. 2015 Oct;94(10 Suppl 1):887-97. doi:
10.1097/PHM.0000000000000293.

Manual Therapy, Therapeutic Patient Education, and Therapeutic Exercise, an Effective Multimodal Treatment of Nonspecific Chronic Neck Pain: A Randomized Controlled Trial.

Beltran-Alacreu H1, López-de-Uralde-Villanueva I, Fernández-Carnero J, La Touche R.

Abstract

OBJECTIVE:

The aim of this study was to determine the effectiveness of a multimodal treatment in the short and medium term for disability in nonspecific chronic neck pain.

DESIGN:

The design of this study is a single-blinded randomized controlled trial carried out in a university research laboratory. Forty-five patients between 18 and 65 yrs with nonspecific chronic neck pain were included in this study. Each patient was treated eight times over a 4-wk period. The sample was divided into three groups: control group, subjected to a protocol of manual therapy; experimental group 1, subjected to a protocol of manual therapy and therapeutic patient education; and experimental group 2, subjected to manual therapy, therapeutic patient education, and a therapeutic exercise protocol. Assessments were performed at baseline and at 4, 8, and 16 wks using the following measurements: the Neck Disability Index, the 11-item Tampa Scale of Kinesiophobia, the Fear Avoidance Beliefs Questionnaire, the Neck Flexor Muscle Endurance Test, and the Visual Analog Fatigue Scale.

RESULTS:

The nonparametric Kruskal-Wallis test for the Neck Disability Index showed statistically significant differences between baseline outcomes and all follow-up periods ($P < 0.01$). In the Kruskal-Wallis test, differences were found for the Visual Analog Fatigue Scale and the Neck Flexor Muscle Endurance Test in the follow-ups at 8 and 16 wks ($P < 0.05$). Analysis of variance for group \times time interaction showed statistically significant changes (Tampa Scale of Kinesiophobia, $F = 3.613$, $P = 0.005$; Fear Avoidance Beliefs Questionnaire, $F = 2.803$, $P = 0.022$). Minimal detectable changes were obtained in both experimental groups for the 11-item Tampa Scale of Kinesiophobia but not in the control group.

CONCLUSION:

Differences between experimental groups and the control group were found in the short and medium term. A multimodal treatment is a good method for reducing disability in patients with nonspecific chronic neck pain in the short and medium term.

PMID: 25888653

45 C. MANUAL THERAPY THORACIC**Thoracic manipulation in shoulder pain****Thoracic manual therapy in the management of non-specific shoulder pain: a systematic review**Aimie L. Peek¹; Caroline Miller²; Nicola R. Heneghan³**Volume 23, Issue 4 (September 2015), pp. 176-187**DOI: <http://dx.doi.org/10.1179/2042618615Y.0000000003>

Abstract

Objectives:

Non-specific shoulder pain (NSSP) is often persistent and disabling leading to high socioeconomic costs. Cervical manipulation has demonstrated improvements in patients with NSSP, although risks associated with thrust techniques are documented. Thoracic manual therapy (TMT) may utilise similar neurophysiological effects with less risk. The current evidence for TMT in treating NSSP is limited to systematic reviews of manual therapy (MT) applied to the upper quadrant. These reviews included trials that used shoulder girdle manual therapy (SG-MT) in the TMT group. This limits the scope of their conclusions with regard to the exclusive effectiveness of TMT for NSSP.

Methods:

This review used a steering group for subject and methodological expertise and was reported in line with Preferred Reporting items for Systematic Reviews and Meta-analysis (PRISMA) guidelines. Key databases were searched (1990–2014) using relevant search terms and medical subject headings (MeSH); eligibility was evaluated independently by two reviewers based on pre-defined criteria. Study participants had NSSP including impingement syndrome and excluding cervical pain. Interventions included cervicothoracic junction and TMT with or without supplementary exercises. Studies that included MT applied to the shoulder girdle including the glenohumeral joint, acromioclavicular joint or sternoclavicular joint in the TMT group, without a control, were excluded. Included studies utilised outcome measures that monitored pain and disability scores. Randomized controlled trials (RCTs) and clinical studies were eligible. Using a standardised form, each reviewer independently extracted data. Risk of bias was assessed using GRADE and PEDro scale. Results were tabulated for semi-quantitative comparison.

Results:

Over 912 articles were retrieved: three RCTs, one single-arm trial and three pre–post test studies were eligible. Studies varied from poor to high quality. Three RCTs demonstrated that TMT reduced pain and disability at 6, 26 and 52 weeks compared with usual care. Two pre–post test studies found between 76% and 100% of patients experienced significant pain reduction immediately post-TMT. An additional pre–post test study and a single-arm trial showed reductions in pain and disability scores 48 hours post-TMT.

Discussion:

Thoracic manual therapy accelerated recovery and reduced pain and disability immediately and for up to 52 weeks compared with usual care for NSSP. Further, high-quality RCTs investigating the effect of TMT in isolation for the treatment of patients with NSSP are now required.

Keywords: Shoulder pain, Thoracic spine, Manipulation, Manual therapy

T spine manip and C spine pain

J Manipulative Physiol Ther. 2015 Sep 18. pii: S0161-4754(15)00084-6. doi: 10.1016/j.jmpt.2015.06.016.

Immediate and Short-Term Effects of Upper Thoracic Manipulation on Myoelectric Activity of Sternocleidomastoid Muscles in Young Women With Chronic Neck Pain: A Randomized Blind Clinical Trial.

Pires PF1, Packer AC2, Dibai-Filho AV3, Rodrigues-Bigaton D4.

Abstract

OBJECTIVE:

The aim of this study was to assess the immediate and short-term effects of upper thoracic spine manipulation on pain intensity and myoelectric activity of the sternocleidomastoid muscles in young women with chronic neck pain.

METHODS:

A randomized clinical trial was carried out involving 32 women with chronic neck pain (mean age, 24.8 ± 5.4 years) allocated to an experimental group and a placebo group. Three evaluations were carried out: baseline, immediate postintervention, and short-term postintervention (48-72 hours after intervention). Myoelectric activity of the right and left sternocleidomastoid muscles was assessed at rest and during isometric contractions for cervical flexion and elevation of the shoulder girdle. Neck pain intensity was assessed at rest using a visual analog scale. Comparisons of the data were performed using 2-way repeated-measures analysis of variance with the Bonferroni correction. The level of significance was set at $P < .05$.

RESULTS:

A moderate treatment effect on myoelectric activity of the right and left sternocleidomastoid muscles during isometric elevation of the shoulder girdle was found in the experimental group only on the short-term postintervention evaluation ($d > 0.40$). No statistically significant differences were found for any of the variables analyzed in the intergroup comparisons at the different evaluation times ($P > .05$).

CONCLUSION:

No statistically significant differences were found in the intragroup or intergroup analyses of the experimental and placebo groups regarding myoelectric activity of the cervical muscles or the intensity of neck pain at rest in the immediate or short-term postintervention evaluations.

Copyright © 2015. Published by Elsevier Inc.

KEYWORDS:

Electromyography; Musculoskeletal Manipulations; Neck Pain

PMID: 26387859

45 D. MANUAL THERAPY EXTREMITIES**MT for Rotator cuff tears****RESEARCH REPORT****The Efficacy of Manual Therapy for Rotator Cuff Tendinopathy: A Systematic Review and Meta-analysis**

Authors: Ariel Desjardins-Charbonneau, PT, MSc¹, Jean-Sébastien Roy, PT, PhD^{2,3}, Clermont E. Dionne, OT, PhD^{2,4}, Pierre Frémont, MD, PhD^{2,5}, Joy C. MacDermid, PT, PhD⁶, François Desmeules, PT, PhD^{1,7}

Published: Journal of Orthopaedic & Sports Physical Therapy, 2015, **Volume:** 45 **Issue:** 5 **Pages:** 330-350 doi:10.2519/jospt.2015.5455

Systematic review and meta-analysis.

ObjectivesTo evaluate the efficacy of manual therapy (MT) for patients with rotator cuff (RC) tendinopathy. **Background**Rotator cuff tendinopathy is a highly prevalent musculoskeletal disorder, for which MT is a common intervention used by physical therapists. However, evidence regarding the efficacy of MT is inconclusive.

MethodsA literature search using terms related to shoulder, RC tendinopathy, and MT was conducted in 4 databases to identify randomized controlled trials that compared MT to any other type of intervention to treat RC tendinopathy. Randomized controlled trials were assessed with the Cochrane risk-of-bias tool. Meta-analyses or qualitative syntheses of evidence were performed.

ResultsTwenty-one studies were included. The majority had a high risk of bias. Only 5 studies had a score of 69% or greater, indicating a moderate to low risk of bias. A small but statistically significant overall effect for pain reduction of MT compared with a placebo or in addition to another intervention was observed (n = 406), which may or may not be clinically important, given a mean difference of 1.1 (95% confidence interval: 0.6, 1.6) on a 10-cm visual analog scale. Adding MT to an exercise program (n = 226) significantly decreased pain (mean difference, 1.0; 95% confidence interval: 0.7, 1.4), as reported on a 10-cm visual analog scale, which may or may not be clinically important. Based on qualitative analyses, it is unclear whether MT used alone or added to an exercise program improves function.

Conclusion For patients with RC tendinopathy, based on low- to moderate-quality evidence, MT may decrease pain; however, it is unclear whether it can improve function. More methodologically sound studies are needed to make definitive conclusions.

Level of EvidenceTherapy, level 1a-. J Orthop Sports Phys Ther 2015;45(5):330-350. Epub 26 Mar 2015. doi:10.2519/jospt.2015.5455

Keyword: mobilization, physical therapy, shoulder impingement syndrome, shoulder pain

Injections vs exercise and joint mob

Foot Ankle Int. 2015 Sep 23. pii: 1071100715607619.

Joint Mobilization and Stretching Exercise vs Steroid Injection in the Treatment of Plantar Fasciitis: A Randomized Controlled Study.

Celik D¹, Kuş G², Sırma SÖ³.

Abstract

BACKGROUND:

This study compared the effectiveness of joint mobilization combined with stretching exercises (JM&Str) vs steroid injection (SI) in the treatment of plantar fasciitis (PF).

METHODS:

A total of 43 patients (mean age, 45.5 ± 8.5 years; range, 30-60 years; 23 females) with PF were randomly assigned to receive either JM&Str (n = 22) or SIs (n = 21). JM&Str was applied 3 times per week for 3 weeks for a total of 9 visits. The SI group received 1 injection at baseline. The patients' functional scores were assessed using the Foot and Ankle Ability Measure (FAAM), and pain was evaluated using the Visual Analog Scale (VAS). Outcomes of interest were captured at baseline and at 3-week, 6-week, 12-week, and 1-year follow-ups. The primary aim was examined using a mixed-model analysis of variance (ANOVA). Pairwise comparisons were performed to examine differences between the baseline and follow-up periods using Bonferroni equality at an alpha level of 0.05.

RESULTS:

Age, sex, body mass index, and dorsiflexion range of motion did not significantly impact pain relief or functional outcome ($P > .05$) at the 3-, 6- or 12-week follow-ups compared to baseline. Planned pairwise comparisons demonstrated significant improvements in pain relief and functional outcomes in both groups ($P < .05$) at the 3-, 6-, and 12-week follow-ups compared to baseline. However, at the 12-week and 1-year follow-ups, pain and functional outcomes were significantly improved in only the JM&Str group ($P = .002$). The overall group-by-time interaction was statistically significant for both FAAM ($P = .001$; $F = 7.0$) and VAS ($P = .001$; $F = 8.3$) scores. Between-group differences favored the SI group at the 3-week ($P = .001$, $P = .001$), 6-week ($P = .002$, $P = .001$), and 12-week ($P = .008$, $P = .001$) follow-ups for pain relief and functional outcomes. However, no significant differences ($P = .62$, $P = .57$) were detected in the measured outcomes at the 1-year follow-up.

CONCLUSION:

Our study demonstrated that while both groups achieved significant improvements at the 3-, 6-, and 12-week follow-ups, the SI group exhibited better outcomes at all 3 time points. The noted improvements continued in only the JM&Str group for a period of time ranging from 12 weeks to 1 year.

LEVEL OF EVIDENCE:

Level II, comparative study.

© The Author(s) 2015.

KEYWORDS:

exercise therapy; fascia; foot pain; manual therapy; pain management

PMID: 26400901

46 A. UPPER LIMB NEUROMOBILIZATION

Fibromyalgia and neural mobilization - helpful

Arch Phys Med Rehabil. 2015 Oct;96(10):1771-8. doi: 10.1016/j.apmr.2015.06.008. Epub 2015 Jul 2.

Results of an Active Neurodynamic Mobilization Program in Patients With Fibromyalgia Syndrome: A Randomized Controlled Trial.

Torres JR1, Martos IC1, Sánchez IT1, Rubio AO1, Pelegrina AD1, Valenza MC2.
Author information

- 1Physical Therapy Department, University of Granada, Granada, Spain.
- 2Physical Therapy Department, University of Granada, Granada, Spain. Electronic address: cvalenza@ugr.es.

Abstract

OBJECTIVE:

To examine the effects of an active neurodynamic mobilization program on pain, neurodynamics, perceived health state, and fatigue in patients with fibromyalgia syndrome (FMS).

DESIGN:

Randomized controlled trial.

SETTING:

Local fibromyalgia association.

PARTICIPANTS:

Patients with FMS (N=48).

INTERVENTIONS:

Patients were randomly allocated to an active neurodynamic mobilization program or a control group. The intervention was performed twice a week.

MAIN OUTCOME MEASURES:

Pain was assessed with the Brief Pain Inventory and Pain Catastrophizing Scale; neurodynamics were evaluated using neurodynamic tests for upper and lower limbs. The functional state was evaluated with the Health Assessment Questionnaire Disability Index, and perceived fatigue was evaluated with the Fatigue Severity Scale.

RESULTS:

Significant ($P < .05$) between-groups differences were found in the values of pain, upper and lower limb neurodynamics, functional state, and fatigue. Also, significant pre- to postintervention within-group differences were found in the intervention group, whereas no significant changes were found in the control group.

CONCLUSIONS:

A neurodynamic mobilization program is effective in improving pain, neurodynamics, functional status, and fatigue in patients with FMS.

KEYWORDS: Fatigue; Fibromyalgia; Health; Pain; Rehabilitation

PMID: 26143052

48 A. STM

Fascial hierarchies

Fascial Hierarchies and the Relevance of Crossed-Helical Arrangements of Collagen to Changes in the Shape of Muscles*

Graham Scarr CBiol, FRSB., FLS., DO

DOI: <http://dx.doi.org/10.1016/j.jbmt.2015.09.004>

Summary

Muscles are composite structures consisting of contractile myofibres surrounded by complex hierarchies of collagen-reinforced fascial sheaths. They are essentially flexible cylinders that change in shape, with the particular alignment of collagen fibres within their myofascial walls reflecting the most efficient distribution of mechanical stresses and coordinating these changes.

However, while the functional significance of this crossed-helical fibre arrangement is well established in other species and in different parts of the body, relatively little attention has been given to this within the fascia of humans; and the relevance of this geometric configuration to muscles and surrounding fascial tissues is described.

Keywords: Collagen, Crossed-helix Crossed, Epimysium, Fascia, Helix, Muscle, Myofascia, Pennation, Perimysium

Sensitization systems**Cross friction algometry (CFA): comparison of pressure pain thresholds between patients with chronic non-specific low back pain and healthy subjects**

Andre Farasyn, PhD PT DO Bert Lassat, MSc PT

DOI: <http://dx.doi.org/10.1016/j.jbmt.2015.09.005>**Summary**

Palpation is widely used to assess muscular sensitivity in clinical settings but still remains a subjective evaluation. This cross-sectional study assessed a newly developed cross-friction algometry making palpation measurable. The objective was to investigate the reliability of pressure pain thresholds obtained using Cross-Friction Algometry (CFA-PPTs) measured at the level of Erector spinae and Gluteus maximus central muscle parts, and to compare the CFA-PPTs between patients with chronic nonspecific low back pain (nCLBP) and matching healthy subjects.

Participants

Patients presenting nCLBP to GP's and send into a Pain Center and healthy subjects recruited via university ad valvas & flyers distribution.

Outcome measures

30 patients with nCLBP were measured for cross-friction algometry. Other evaluations consisted of the Visual Analogue Scale (VAS) and the Oswestry Disability Index (ODI).

Results

The inter- and intra-reliability were tested and found to be sufficient. The mean CFA-PPT values of the Erector spinae at levels T8, T10, L1 & L3 and the Gluteus maximus of the nCLBP group were significantly lower ($p \leq 0.001$) when compared to the CFA-PPT values of the healthy group. The greatest difference (-58 %) was found at L1 Erector spinae level and at the superior part of the Gluteus maximus measuring point (-59 %). Within the group of patients with nCLBP it was surprising to notice that there was no significant correlation between all the reference points measured using CFA-PPTs and resp. the outcomes of the VAS and ODI scores.

Conclusions

With the aid of CFA, the importance of local muscular disorder in the lumbar part of the Erector spinae and Gluteus maximus in patients with nCLBP is obviously demonstrated, but also reveals the very large inter-individual differences in muscular fibrosis sensitivity and/or pain behavior in daily life. This possibly re-opens the debate on which influences can be put forward as the most important: the central or the peripheral sensitization system.

48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE**Warm needling**

Clinical Study Journal of Acupuncture and Tuina Science
October 2015, Volume 13, Issue 5, pp 324-327

Clinical observation on warm needling therapy for scapulohumeral periarthritis: a randomized controlled trial

Ying-chun Chen , Zhen-gen Fen

Objective

To evaluate the clinical effects of warm needling for scapulohumeral periarthritis (SP).

Methods

Eighty-six patients with SP due to wind, cold and dampness in conformity with the research criteria were randomly divided into an observation group and a control group. The control group was given the routine acupuncture treatment and the observation group was treated by warm needling. The treatment was given once every day and ten sessions made one course. After two courses, the therapeutic effects and the changes in the scores of visual analogue scale (VAS) were observed.

Results

After treatment, VAS scores were statistically different from those before treatment in the two groups ($P < 0.05$); and VAS score was lower in the observation group than that in the control group, with a statistical difference between the two groups ($P < 0.05$). The curative and remarkable effective rate was 74.4% in the observation group and 44.2% in the control group. The difference in the curative and remarkable effective rate was statistically significant between the two groups ($P < 0.01$). But, the difference in the total effective rate was not statistically significant between the two groups ($P > 0.05$).

Conclusion

The warm needling has the dual effect of acupuncture and moxibustion in the treatment of SP due to wind, cold and dampness, and its clinical effect is better than routine acupuncture treatment.

Keywords Acupuncture-moxibustion Therapy Acupuncture Therapy Warm Needling Therapy Periarthritis Shoulder Pain Randomized Controlled Trial

Trigger points and LBP

J Manipulative Physiol Ther. 2015 Sep 18. pii: S0161-4754(15)00127-X. doi: 10.1016/j.jmpt.2015.08.004. [Epub ahead of print]

Prevalence, Incidence, Localization, and Pathophysiology of Myofascial Trigger Points in Patients With Spinal Pain: A Systematic Literature Review.

Lluch E1, Nijs J2, De Kooning M2, Van Dyck D3, Vanderstraeten R3, Struyf F4, Roussel NA4.

Abstract

OBJECTIVE:

A systematic review was performed to evaluate the existing evidence related to the prevalence, incidence, localization, and pathophysiology of myofascial trigger points (MTrPs) in patients with spinal (back and neck) pain.

METHODS:

A systematic review following Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines was performed in 2 electronic databases (PubMed and Web of Science) using predefined keywords regarding MTrPs and spinal pain. A "PICOS" questionnaire was used to set up the search strategies and inclusion criteria. Full-text reports concerning MTrPs in patients with back or neck pain, which described their prevalence, incidence, location, or underlying physiopathology were included and screened for methodological quality by 3 independent researchers. Each study was assessed for risk of bias using a checklist derived from the Web site of the Dutch Cochrane Centre.

RESULTS:

Fourteen articles were retrieved for quality assessment and data extraction. Studies reporting the incidence of MTrPs in patients with spinal pain were lacking. Within spinal pain, patients with neck pain were found to have the highest prevalence rates of MTrPs. The trapezius descendens, levator scapulae, and suboccipitales muscles were the most prevalent locations for active MTrPs in patients with neck pain. Latent MTrPs were present in asymptomatic people, but no significant differences were found in the prevalence rate of latent MTrPs between patients with spinal (neck) pain and healthy controls. The only study investigating prevalence of MTrPs in different localizations of the same muscle reported no significant differences in prevalence between active and latent MTrPs within the trapezius descendens muscle. Studies examining pathophysiological mechanisms underlying MTrPs demonstrated an acidic environment, high concentration of algogenic/inflammatory substances, stiffer muscle tissue, retrograde diastolic blood flows, spontaneous muscle activity at rest, and loss of muscle contractibility in muscles with MTrPs. Altered central processing was also found to play a role in the development of MTrPs.

CONCLUSIONS:

Myofascial trigger points are a prevalent clinical entity, especially in patients with neck pain. Evidence was not found to support or deny the role of MTrPs in other spinal pain. Compelling evidence supports local mechanisms underlying MTrPs. Future research should unravel the relevance of central mechanisms and investigate the incidence of MTrPs in patients with spinal pain.

KEYWORDS: Low Back Pain; Myofascial Pain Syndromes; Neck Pain; Systematic Review; Trigger Points

PMID: 26387860

Migraine and acupuncture

Clinical study on nape cluster acupuncture for 50 cases of migrainesponsor

Journal of Acupuncture and Tuina Science, 10/15/2015Qi LZ, et al.

The aim of this study is to observe the clinical efficacy of nape cluster acupuncture in treating migraine. Nape cluster acupuncture is effective in treating migraine, significantly improving headache and depression.

Methods

- Fifty patients with confirmed diagnosis of migraine were intervened by using nape cluster acupuncture, and were evaluated at the outset and after 2-month treatment by the short-form of McGill pain questionnaire (SP-MPQ) and self-rating depression scale (SDS).

Results

- After treatment, the number of positive words, sensory pain rating index (S-PRI), affective pain rating index (A-PRI), total pain rating index (T-PRI), visual analogue scale (VAS), and present pain intensity (PPI) were significantly changed ($P < 0.01$); the SDS score was (56.42 ± 8.12) points before treatment versus (41.08 ± 5.73) points after treatment, and the difference was statistically significant ($P < 0.01$).
- The total effective rate was 86.0%; the therapeutic efficacy of the patients with a shorter disease duration was superior to that of the patients with a longer one ($P < 0.05$); the efficacy of mild-moderate migraine was superior to that of severe one ($P < 0.01$); the total effective rate of patients without depression was higher than that with depression, but without a significant difference in comparing the therapeutic efficacy ($P > 0.05$).

52. EXERCISE**Athletes muscle changes**

Medicine & Science in Sports & Exercise:
doi: 10.1249/MSS.0000000000000789

Muscle Characteristics and Substrate Energetics in Lifelong Endurance Athletes.

Dubé, John J.; Broskey, Nicholas T.; Despines, Alex A.; Stefanovic-Racic, Maja; Toledo, Frederico G.S.; Goodpaster, Bret H.; Amati, Francesca

Abstract

Purpose: The goal of this study was to explore the effect of lifelong aerobic exercise (i.e. chronic training) on skeletal muscle substrate stores (intramyocellular triglyceride [IMTG] and glycogen), skeletal muscle phenotypes, and oxidative capacity (ox), in older endurance-trained master athletes (OA) compared to non-competitive recreational younger (YA) athletes matched by frequency and mode of training.

Methods: Thirteen OA (64.8±4.9 yo) exercising ≥ 5 times/week were compared to 14 YA (27.8±4.9 yo) males and females. IMTG, glycogen, fiber types, succinate dehydrogenase (SDH) and capillarization were measured by immunohistochemistry in vastus lateralis biopsies. Fat-ox and carbohydrate (CHO)-ox were measured by indirect calorimetry before and after an insulin clamp and during a cycle ergometer graded maximal test.

Results: $\dot{V}O_2$ peak was lower in OA than YA. OA had greater IMTG in all fiber types and lower glycogen stores than YA. This was reflected in greater proportion of type I and less type II fibers in OA. Type I fibers were similar in size, while type II fibers were smaller in OA compared to YA. Both groups had similar SDH content. Numbers of capillaries per fiber were reduced in OA but with a higher number of capillaries per area. Metabolic flexibility and insulin sensitivity were similar in both groups. Exercise metabolic efficiency was higher in OA. At moderate exercise intensities, CHO-ox was lower in OA but with similar Fat-ox.

Conclusion: Lifelong exercise is associated with higher IMTG content in all muscle fibers and higher metabolic efficiency during exercise that are not explained by differences in muscle fibers types and other muscle characteristics when comparing older to younger athletes matched by exercise mode and frequency.

(C) 2015 American College of Sports Medicine

Exercise impact on muscle

Medicine & Science in Sports & Exercise:

doi: 10.1249/MSS.0000000000000787

Myokine Expression in Muscle and Myotubes in Response to Exercise Stimulation.

Covington, Jeffrey D.; Tam, Charmaine S.; Bajpeyi, Sudip; Galgani, Jose E.; Noland, Robert C.; Smith, Steven R.; Redman, Leanne M.; Ravussin, Eric

Abstract

Purpose: Myokines have been shown to affect muscle physiology and exert systemic effects. We endeavored to investigate a panel of myokine mRNA expression following a single exercise bout (Study 1) and 2) to measure myokine mRNA in primary human myotubes in an in vitro exercise model (Study 2).

Methods: Vastus lateralis muscle biopsies were obtained from 20 healthy males (age: 24.0 \pm 4.5yrs; BMI: 23.6 \pm 1.8 kg/m²) before and after a single exercise bout (650 kcal at 50% VO₂max). Primary myotubes from active and sedentary male donors were treated with a pharmacological cocktail (palmitate, forskolin and ionomycin; PFI) to mimic exercise-stimulated contractions in vitro.

Results: Interleukin 6 and 8 (IL-6 and IL-8), leukocyte inducing factor (LIF), and connective tissue growth factor (CTGF) mRNA levels increased ~10 fold after a single exercise bout (all $p < 0.001$), while myostatin levels decreased ($p < 0.05$). Key correlations between myokine expression and parameters of muscle and whole-body physiology were found: myostatin versus skeletal muscle citrate synthase activity ($r = -0.69$, $p < 0.001$), VO₂Max ($r = -0.64$, $p = 0.002$), and the % of type-I fibers ($r = -0.55$, $p = 0.01$); IL-6 versus the respiratory exchange ratio (RER, $r = 0.45$, $p = 0.04$), HOMA-IR ($r = 0.44$, $p = 0.05$), and serum lactate ($r = 0.50$, $p = 0.02$). Myokine expressions in myotubes from sedentary donors for CTGF and myostatin decreased while IL-6 and IL-8 increased after PFI treatment. In myotubes from active donors, myokine expression increased for IL-6, CTGF, and myostatin, but decreased for IL-8 following PFI treatment.

Conclusion: These data offer insight into the differences in regulation of myokine expression and their possible physiologic relationships.

(C) 2015 American College of Sports Medicine

54. POSTURE

Sagittal posture

Sagittal evaluation of usual standing and sitting spinal posture

Dr. Kurt Claeys, PhD, MT Prof. Dr. Simon Brumagne, PhD Jan Deklerck, M.Sc Dr. Jacques Vanderhaeghen, PhD Prof. Dr. Wim Dankaerts, PhD, MT

DOI: <http://dx.doi.org/10.1016/j.jbmt.2015.10.002>

Abstract

Postural rehabilitation often plays an important role in the management of non-specific low back pain.

While cervical and lumbar correlations have been demonstrated previously, the different role of the pelvis and the thoracic spine for postural control in sitting and standing remains unclear.

The aim of this study was to investigate postural correlations between all spinal regions in standing and sitting. Based on digital photographs eight postural angles were analyzed in 99 young healthy persons. Pearson correlations between different postural angles were calculated. In sitting pelvic tilt demonstrated mostly medium correlations with five out of seven other postural angles, compared to three in standing.

In standing trunk angle showed five out of seven mostly medium correlations with other regions compared to four out of seven in usual sitting. The low and different correlations suggest a large between-subject variability in sagittal spinal posture, without the existence of any optimal sagittal posture.

Changes with hip OA

Characteristics of sagittal spine-pelvis-leg alignment in patients with severe hip osteoarthritis comorbid with low back pain

sponsor

The Spine Journal, 10/13/2015 Weng W, et al.

The interaction between the sagittal alignment of the spine and pelvis and the compensatory mechanism in patients suffering from spinal disorders has been well documented.

However, in patients with hip osteoarthritis (HOA), few studies have explored how the hip joint pathology could affect the sagittal alignment of the hip, pelvis and spine, and no reports have investigated whether these changes are involved in the pathogenesis of low back pain (LBP) in these patients.

Pelvis and lumbar spine

Spine J. 2015 Sep 22. pii: S1529-9430(15)01397-2. doi: 10.1016/j.spinee.2015.09.021.

Segmental pelvic correlation (SPeC): a novel approach to understanding sagittal plane spinal alignment.

Anwar HA¹, Butler JS², Yarashi T¹, Rajakulendran K¹, Molloy S¹.

Abstract

BACKGROUND CONTEXT:

Lumbar lordosis correlates with pelvic morphology and it has been demonstrated that as lumbar lordosis increases, the inflection point and apex of lordosis move cranially. This suggests that each segment of the lumbar spine relates to pelvic morphology in a unique way.

OBJECTIVES:

To establish whether there is a direct relationship between pelvic morphology and lumbar segmental angulation in the sagittal plane.

STUDY DESIGN:

Retrospective analysis of 41 patient radiographs.

PATIENT SAMPLE:

Inclusion criteria included patients with full length standing anteroposterior and lateral radiographs of the spine from base of occiput to proximal femora, with clearly visible vertebral endplates from T12 to S1 and a thoracic kyphosis and lumbar lordosis within the normal range. Patients were excluded if they had a coronal spinal deformity affecting the lumbar spine, chronic back pain, spondylolisthesis, spondylolysis, congenital scoliosis or skeletal dysplasia.

OUTCOME MEASURES:

Spinopelvic radiographic parameters of Pelvic incidence (PI), Lumbar Lordosis (LL), Thoracic Kyphosis (TK) and segmental angulation at each level from L1 to the sacrum.

METHODS:

41 lateral whole spine radiographs from the spinal deformity clinic with normal sagittal profiles were retrospectively reviewed. PI, LL, TK and segmental angulation at each level from L1 to the sacrum were measured (from endplate to endplate) distinguishing the vertebral body and intervertebral disc contribution. Pearson correlation coefficients were used to analyze any relationship between pelvic parameters and segmental angulation.

RESULTS:

A strong correlation was found between PI and LL. PI correlated strongly with the L1 and L2 motion segments ($p=0.0001$, $p=0.03$), notably at the intervertebral discs but not the L4 and L5 motion segments. The proportion of total lumbar lordosis contributed at L4/5 and L5/S1 reduced as pelvic incidence increased.

CONCLUSIONS:

PI can predict segmental angulation. Although the majority of lumbar lordosis is produced at L4 and L5 motion segments, cephalad lumbar segments sequentially become increasingly important as PI increases. This describes a continuum where the L1 and L2 motion segments crucially fine tune total LL according to PI. This allows segmental abnormalities to be identified when compensation in adjacent segments maintain normal total LL. It also paves the way for anatomical segmental reconstruction in degenerative adult deformity based on pelvic morphology.

56. ATHLETICS**Resisted exercise can increase velocity**

J Strength Cond Res. 2015 Oct;29(10):2964-79. doi: 10.1519/JSC.0000000000000931.

Increasing Ball Velocity in the Overhead Athlete: A Meta-analysis of Randomized Controlled Trials.

Myers NL1, Sciascia AD, Westgate PM, Kibler WB, Uhl TL.

Abstract

Overhead athletes routinely search for ways to improve sport performance, and one component of performance is ball velocity.

The purpose of this meta-analysis was to investigate the effect of different strengthening interventions on ball and serve velocity. A comprehensive literature search with pre-set inclusion and exclusion criteria from 1970 to 2014 was conducted. Eligible studies were randomized control trials including the mean and SDs of both pretest and posttest ball velocities in both the experimental and the control groups. The outcome of interest was ball/serve velocity in baseball, tennis, or softball athletes. Level 2 evidence or higher was investigated to determine the effect different training interventions had on velocity. Pretest and posttest data were extracted to calculate Hedges's *g* effect sizes with 95% confidence intervals (CIs). Methodological qualities of the final 13 articles within the analysis were assessed using the Physiotherapy Evidence Database scale. The majority of the articles included in this analysis had an effect on velocity with the strongest effect sizes found in periodized training (Hedges's *g* = 3.445; 95% CI = 1.976-4.914). Six studies had CI that crossed zero, indicating that those specific interventions should be interpreted with caution. Consistent and high-quality evidence exists that specific resistance training interventions have an effect on velocity.

These findings suggest that interventions consisting of isokinetic training, multimodal training, and periodization training are clinically beneficial at increasing velocity in the overhead athlete over different windows of time.

PMID: 25763521

58. RUNNING**Foot strike patterns**

J Biomech. 2015 Sep 18;48(12):3502-5. doi: 10.1016/j.jbiomech.2015.07.036. Epub 2015 Aug 11.

A kinematic method to detect foot contact during running for all foot strike patterns.

Milner CE1, Paquette MR2.

Abstract

The biomechanics of distance running are studied in relation to both understanding injury mechanisms and improving performance.

Kinematic methods must be used to identify the stance phase of running when data are recorded during running on a standard treadmill or outside the laboratory. Recently, a focus on foot strike patterns has emerged in the field. Thus, there is a need for a kinematic method to identify foot contact that is equally effective for both rearfoot and non-rearfoot strike patterns. The purpose of this study was to determine whether a new kinematic method could accurately determine foot contact during running in both rearfoot and non-rearfoot strikers. Overground gait data were collected at on 22 runners, 11 with a rearfoot strike pattern and 11 with a non-rearfoot strike pattern. Data were processed to identify foot contact from: vertical ground reaction force, two previously published kinematic methods, and our new kinematic method. Limits of agreement were used to determine bias and random error of each kinematic method compared to ground reaction force onset. The new method had comparable random error at 200Hz sampling frequency (5ms per frame) to the previous methods (7 frames vs 6-9 frames) and produced the same offset for both strike patterns (3 frames), while the existing methods had different offsets for different strike patterns (4 or 7 frames).

Study findings support use of this new method, as it can be applied to all running strike patterns without adjusting the frame offset, simplifying data processing.

Copyright © 2015 Elsevier Ltd. All rights reserved.

KEYWORDS:

Gait; Ground reaction force; Heel strike; Strike index

PMID: 26283411

59. PAIN**Detecting feigning**

J Pain. 2015 Oct;16(10):1044-53. doi: 10.1016/j.jpain.2015.07.004. Epub 2015 Aug 8.

Distinguishing Feigned From Sincere Performance in Psychophysical Pain Testing.

Kucyi A¹, Scheinman A², Defrin R³.

Abstract

Self-report, the most widely used, gold standard measurement of pain, is crucial for pain research, diagnosis, and management. However, there are no accurate, reliable methods for detecting dishonesty in self-reports when there is incentive for pain deception.

We introduce a novel approach to detecting pain deception by analyzing performance patterns of honest and dishonest psychophysical pain testing. Warmth sensation threshold (WST) and heat pain threshold (HPT) were measured in healthy individuals (N = 37) under 2 conditions: standard instruction (ie, provide sincere reports) and instructions to simulate intense pain (ie, provide feigned reports) with the intention of deceiving. In the feigned compared with sincere condition, participants had significantly increased WST and decreased HPT. Repeatability and variability indices were indistinguishable between conditions. In a second, separate cohort (N = 24), measurements were repeated with the addition of a sensory interference to influence task performance. When sensory interference during HPT measurement was introduced, feigned pain reports had significantly higher variability and poorer repeatability compared with sincere reports and were distinguishable from sincere reports, with high sensitivity (83%) and specificity (84%).

The statistical properties of psychophysical performance under sensory interference provide a method for identifying feigned performance and could be applied to evaluations of pain malingering.

PERSPECTIVE:

This article introduces a method to detect whether individuals are being dishonest in psychophysical pain testing. The method could help clinicians to detect chronic pain malingering in contexts in which there is incentive to deceive.

Copyright © 2015 American Pain Society. Published by Elsevier Inc. All rights reserved.

KEYWORDS:

Malingering; lie detection; pain psychophysics; sensory interference

PMID: 26259781

Depression

J Affect Disord. 2015 Sep 25;189:118-125. doi: 10.1016/j.jad.2015.09.028.

Association of Type D personality with increased vulnerability to depression: Is there a role for inflammation or endothelial dysfunction? - The Maastricht Study.

van Dooren FE¹, Verhey FR², Pouwer F³, Schalkwijk CG⁴, Sep SJ⁴, Stehouwer CD⁴, Henry RM⁴, Dagnelie PC⁵, Schaper NC⁶, van der Kallen CJ⁴, Koster A⁷, Schram MT⁴, Denollet J⁸.

Abstract

BACKGROUND:

Type D personality - the combination of negative affectivity (NA) and social inhibition (SI) - has been associated with depression but little is known about underlying mechanisms. We examined whether (1) Type D is a vulnerability factor for depression in general, (2) Type D is associated with inflammation or endothelial dysfunction, and (3) these biomarkers alter the possible association between Type D and depression.

METHODS:

In the Maastricht Study, 712 subjects underwent assessment of NA, SI and Type D personality (DS14), depressive disorder (Mini-International Neuropsychiatric Interview) and depressive symptoms (Patient Health Questionnaire-9). Plasma biomarkers of inflammation (hsCRP, SAA, sICAM-1, IL-6, IL-8, TNF- α) and endothelial dysfunction (sVCAM-1, sICAM-1, E-selectin, vWF) were measured with sandwich immunoassays or ELISA and combined into standardized sumscores.

RESULTS:

Regarding personality, 49% of the study population was low in NA and SI, 22% had SI only, 12% NA only and 17% had Type D. Depressive disorder and depressive symptoms were significantly more prevalent in Type D versus the other three personality subgroups. Multivariable regression analyses showed that Type D was associated with inflammation ($\beta=0.228$, $p=0.014$) and endothelial dysfunction ($\beta=0.216$, $p=0.022$). After adjustment for these biomarkers, Type D remained independently associated with increased vulnerability to depressive disorder (OR=13.20, $p<0.001$) and depressive symptoms ($\beta=3.87$, $p<0.001$).

LIMITATIONS:

The cross-sectional design restrained us to draw any conclusions on causality. The relatively low prevalence of depressive disorder restrained us to adjust for more potential confounders.

CONCLUSIONS:

Type D personality may be a vulnerability factor for depression, irrespective of levels of inflammation or endothelial dysfunction. Future research should examine possible underlying mechanisms.

Copyright © 2015 Elsevier B.V. All rights reserved.

KEYWORDS:

Depression; Endothelial dysfunction; Inflammation; Personality

PMID: 26433759

Brain changes

Review

Relationship between chronic pain and brain reorganization after deafferentation: A systematic review of functional MRI findings *

- C.R. Jutzeler^{a, *}, A. Curt^a, J.L.K. Kramer^{a, b}
-

doi:10.1016/j.nicl.2015.09.018

Highlights

- In line with the concept of maladaptive plasticity, there is evidence of a relationship between brain reorganization, deafferentation, and chronic pain.
Emerging evidence also suggests that reorganization in the central nervous system could be an adaptive process, preventing the emergence of neuropathic pain.
- Further studies adopting standardized protocols are needed to clarify the role of chronic neuropathic pain and plasticity in the brain.

Abstract

Background

Mechanisms underlying the development of phantom limb pain and neuropathic pain after limb amputation and spinal cord injury, respectively, are poorly understood. The goal of this systematic review was to assess the robustness of evidence in support of “maladaptive plasticity” emerging from applications of advanced functional magnetic resonance imaging (MRI).

Methods

Using MeSH heading search terms in PubMed and SCOPUS, a systematic review was performed querying published manuscripts.

Results

From 146 candidate publications, 10 were identified as meeting the inclusion criteria. Results from fMRI investigations provided some level of support for maladaptive cortical plasticity, including longitudinal studies that demonstrated a change in functional organization related to decreases in pain. However, a number of studies have reported no relationship between reorganization, pain and deafferentation, and emerging evidence has also suggested the opposite — that is, chronic pain is associated with preserved cortical function.

Conclusion

Based solely on advanced functional neuroimaging results, there is only limited evidence for a relationship between chronic pain intensity and reorganization after deafferentation. The review demonstrates the need for additional neuroimaging studies to clarify the relationship between chronic pain and reorganization.

Pain education

A qualitative exploration of people's experiences of Pain Neurophysiological Education for chronic pain: the importance of relevance for the individual

Victoria Robinson, MSc (Senior Physiotherapist) Richard King, MSc (Senior Physiotherapist)
Dr Cormac G. Ryan, PhD (Senior Lecturer in Physiotherapy)
Denis J. Martin, DPhil (Professor of Rehabilitation)

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.001>

Highlights

- Chronic pain patients received two hours of Pain Neurophysiology education (PNE)
- Patients were interviewed about their PNE experience
- The majority (8/10) of patients found PNE relevant to them and reported benefits
- A minority (2/10) did not find PNE relevant to them and reported no benefits
- There was evidence of pain reconceptualisation but it was partial and patchy
-

Abstract

Pain neurophysiology education (PNE) is a distinct form of patient education in pain management.

The aims of this study were to explore the experience of PNE for people with chronic pain and to gain insight into their understanding of their pain after PNE. This was a qualitative study, based on Interpretive Phenomenology Analysis, using individual semi-structured interviews to collect data. We recruited a purposive sample of 10 adults with chronic musculoskeletal pain (men and women; mean age 48 years; with a mean pain duration of 9 years) who had recently completed PNE delivered as a single two-hour group session.

The interview transcripts were analysed for emerging themes. We identified three themes: perceived relevance for the individual participant; perceived benefits for the individual participant; and evidence of reconceptualisation. An interlinking narrative was the importance of relevance. Eight participants viewed the session as relevant and reported benefits ranging from a better understanding of pain, improved ability to cope with the pain, and some suggested improved levels of physical activity. Four of these participants showed evidence of reconceptualisation, which we describe as partial and patchy. Two participants reported no benefit and did not perceive the material delivered within PNE to be relevant to themselves.

Relevance to the individual needs of a person with chronic pain may be a key factor in the success of PNE, and this is a particular challenge when it is delivered in a group situation.

Keywords:

Chronic musculoskeletal pain, Patient education, Qualitative

61. FIBROMYALGIA

Fibromyalgia and neural mobilization - helpful

Arch Phys Med Rehabil. 2015 Oct;96(10):1771-8. doi: 10.1016/j.apmr.2015.06.008. Epub 2015 Jul 2.

Results of an Active Neurodynamic Mobilization Program in Patients With Fibromyalgia Syndrome: A Randomized Controlled Trial.

Torres JR1, Martos IC1, Sánchez IT1, Rubio AO1, Pelegrina AD1, Valenza MC2.
Author information

- 1Physical Therapy Department, University of Granada, Granada, Spain.
- 2Physical Therapy Department, University of Granada, Granada, Spain. Electronic address: cvalenza@ugr.es.

Abstract

OBJECTIVE:

To examine the effects of an active neurodynamic mobilization program on pain, neurodynamics, perceived health state, and fatigue in patients with fibromyalgia syndrome (FMS).

DESIGN:

Randomized controlled trial.

SETTING:

Local fibromyalgia association.

PARTICIPANTS:

Patients with FMS (N=48).

INTERVENTIONS:

Patients were randomly allocated to an active neurodynamic mobilization program or a control group. The intervention was performed twice a week.

MAIN OUTCOME MEASURES:

Pain was assessed with the Brief Pain Inventory and Pain Catastrophizing Scale; neurodynamics were evaluated using neurodynamic tests for upper and lower limbs. The functional state was evaluated with the Health Assessment Questionnaire Disability Index, and perceived fatigue was evaluated with the Fatigue Severity Scale.

RESULTS:

Significant ($P<.05$) between-groups differences were found in the values of pain, upper and lower limb neurodynamics, functional state, and fatigue. Also, significant pre- to postintervention within-group differences were found in the intervention group, whereas no significant changes were found in the control group.

CONCLUSIONS:

A neurodynamic mobilization program is effective in improving pain, neurodynamics, functional status, and fatigue in patients with FMS.

KEYWORDS: Fatigue; Fibromyalgia; Health; Pain; Rehabilitation

PMID: 26143052

62 B. CRYOTHERAPY**Whole body cryotherapy not proven for muscle soreness**

Cochrane Database Syst Rev. 2015 Sep 18;9:CD010789.

Whole-body cryotherapy (extreme cold air exposure) for preventing and treating muscle soreness after exercise in adults.

Costello JT1, Baker PR, Minett GM, Bieuzen F, Stewart IB, Bleakley C.

Abstract

BACKGROUND:

Recovery strategies are often used with the intention of preventing or minimising muscle soreness after exercise. Whole-body cryotherapy, which involves a single or repeated exposure(s) to extremely cold dry air (below -100 °C) in a specialised chamber or cabin for two to four minutes per exposure, is currently being advocated as an effective intervention to reduce muscle soreness after exercise.

OBJECTIVES:

To assess the effects (benefits and harms) of whole-body cryotherapy (extreme cold air exposure) for preventing and treating muscle soreness after exercise in adults.

SEARCH METHODS:

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register, the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL, the British Nursing Index and the Physiotherapy Evidence Database. We also searched the reference lists of articles, trial registers and conference proceedings, handsearched journals and contacted experts. The searches were run in August 2015.

SELECTION CRITERIA:

We aimed to include randomised and quasi-randomised trials that compared the use of whole-body cryotherapy (WBC) versus a passive or control intervention (rest, no treatment or placebo treatment) or active interventions including cold or contrast water immersion, active recovery and infrared therapy for preventing or treating muscle soreness after exercise in adults. We also aimed to include randomised trials that compared different durations or dosages of WBC. Our prespecified primary outcomes were muscle soreness, subjective recovery (e.g. tiredness, well-being) and adverse effects.

DATA COLLECTION AND ANALYSIS:

Two review authors independently screened search results, selected studies, assessed risk of bias and extracted and cross-checked data. Where appropriate, we pooled results of comparable trials. The random-effects model was used for pooling where there was substantial heterogeneity. We assessed the quality of the evidence using GRADE.

MAIN RESULTS:

Four laboratory-based randomised controlled trials were included. These reported results for 64 physically active predominantly young adults (mean age 23 years). All but four participants were male. Two trials were parallel group trials (44 participants) and two were cross-over trials (20 participants). The trials were heterogeneous, including the type, temperature, duration and frequency of WBC, and the type of preceding exercise. None of the trials reported active surveillance of predefined adverse events. All four trials had design features that carried a high

risk of bias, potentially limiting the reliability of their findings. The evidence for all outcomes was classified as 'very low' quality based on the GRADE criteria. Two comparisons were tested: WBC versus control (rest or no WBC), tested in four studies; and WBC versus far-infrared therapy, also tested in one study. No studies compared WBC with other active interventions, such as cold water immersion, or different types and applications of WBC. All four trials compared WBC with rest or no WBC. There was very low quality evidence for lower self-reported muscle soreness (pain at rest) scores after WBC at 1 hour (standardised mean difference (SMD) -0.77, 95% confidence interval (CI) -1.42 to -0.12; 20 participants, 2 cross-over trials); 24 hours (SMD -0.57, 95% CI -1.48 to 0.33) and 48 hours (SMD -0.58, 95% CI -1.37 to 0.21), both with 38 participants, 2 cross-over studies, 1 parallel group study; and 72 hours (SMD -0.65, 95% CI -2.54 to 1.24; 29 participants, 1 cross-over study, 1 parallel group study). Of note is that the 95% CIs also included either no between-group differences or a benefit in favour of the control group. One small cross-over trial (9 participants) found no difference in tiredness but better well-being after WBC at 24 hours post exercise. There was no report of adverse events. One small cross-over trial involving nine well-trained runners provided very low quality evidence of lower levels of muscle soreness after WBC, when compared with infrared therapy, at 1 hour follow-up, but not at 24 or 48 hours. The same trial found no difference in well-being but less tiredness after WBC at 24 hours post exercise. There was no report of adverse events.

AUTHORS' CONCLUSIONS:

There is insufficient evidence to determine whether whole-body cryotherapy (WBC) reduces self-reported muscle soreness, or improves subjective recovery, after exercise compared with passive rest or no WBC in physically active young adult males. There is no evidence on the use of this intervention in females or elite athletes. The lack of evidence on adverse events is important given that the exposure to extreme temperature presents a potential hazard. Further high-quality, well-reported research in this area is required and must provide detailed reporting of adverse events.

PMID:26383887

63. PHARMACOLOGY**Placebo effect**

JAMA Psychiatry. 2015 Sep 30;1-8. doi: 10.1001/jamapsychiatry.2015.1335.

Association Between Placebo-Activated Neural Systems and Antidepressant Responses: Neurochemistry of Placebo Effects in Major Depression.

Peciña M¹, Bohnert AS², Sikora M¹, Avery ET¹, Langenecker SA³, Mickey BJ¹, Zubieta JK⁴.

Abstract

IMPORTANCE:

High placebo responses have been observed across a wide range of pathologies, severely impacting drug development.

OBJECTIVE:

To examine neurochemical mechanisms underlying the formation of placebo effects in patients with major depressive disorder (MDD).

DESIGN, SETTING, AND PARTICIPANTS:

In this study involving 2 placebo lead-in phases followed by an open antidepressant administration, we performed a single-blinded 2-week crossover randomized clinical trial of 2 identical oral placebos (described as having either active or inactive fast-acting antidepressant-like effects) followed by a 10-week open-label treatment with a selective serotonin reuptake inhibitor or, in some cases, another agent as clinically indicated. The volunteers (35 medication-free patients with MDD at a university health system) were studied with positron emission tomography and the μ -opioid receptor-selective radiotracer [¹¹C]carfentanil after each 1-week inactive and active oral placebo treatment. In addition, 1 mL of isotonic saline was administered intravenously within sight of the volunteer during positron emission tomographic scanning every 4 minutes over 20 minutes only after the 1-week active placebo treatment, with instructions that the compound may be associated with the activation of brain systems involved in mood improvement. This challenge stimulus was used to test the individual capacity to acutely activate endogenous opioid neurotransmission under expectations of antidepressant effect.

MAIN OUTCOMES AND MEASURES:

Changes in depressive symptoms in response to active placebo and antidepressant. Baseline and activation measures of μ -opioid receptor binding.

RESULTS:

Higher baseline μ -opioid receptor binding in the nucleus accumbens was associated with better response to antidepressant treatment ($r = 0.48$; $P = .02$). Reductions in depressive symptoms after 1 week of active placebo treatment, compared with the inactive, were associated with increased placebo-induced μ -opioid neurotransmission in a network of regions implicated in emotion, stress regulation, and the pathophysiology of MDD, namely, the subgenual anterior cingulate cortex, nucleus accumbens, midline thalamus, and amygdala (nucleus accumbens: $r = 0.6$; $P < .001$). Placebo-induced endogenous opioid release in these regions was associated with better antidepressant treatment response, predicting 43% of the variance in symptom improvement at the end of the antidepressant trial.

CONCLUSIONS AND RELEVANCE:

These data demonstrate that placebo-induced activation of the μ -opioid system is implicated in the formation of placebo antidepressant effects in patients with MDD and also participate in antidepressant responses, conferring illness resiliency, during open administration.

64. ELECTROTHERAPY**Laser and knee OA**

Lasers Med Sci. 2015 Sep 29.

Does addition of low-level laser therapy (LLLT) in conservative care of knee arthritis successfully postpone the need for joint replacement?

Ip D¹.

Abstract

The current study evaluates whether the addition of low-level laser therapy into standard conventional physical therapy in elderly with bilateral symptomatic tri-compartmental knee arthritis can successfully postpone the need for joint replacement surgery. A prospective randomized cohort study of 100 consecutive unselected elderly patients with bilateral symptomatic knee arthritis with each knee randomized to receive either treatment protocol A consisting of conventional physical therapy or protocol B which is the same as protocol A with added low-level laser therapy. The mean follow-up was 6 years. Treatment failure was defined as breakthrough pain which necessitated joint replacement surgery.

After a follow-up of 6 years, patients clearly benefited from treatment with protocol B as only one knee needed joint replacement surgery, while nine patients treated with protocol A needed surgery ($p < 0.05$). We conclude low-level laser therapy should be incorporated into standard conservative treatment protocol for symptomatic knee arthritis.

KEYWORDS:

Knee pain; Laser therapy; Osteoarthritis; Outcome

PMID: 26420240

US and knee OA

Clin Rehabil. 2015 Oct 8. pii: 0269215515609415.

Effects of therapeutic ultrasound on pain, physical functions and safety outcomes in patients with knee osteoarthritis: A systematic review and meta-analysis.

Zhang C¹, Xie Y², Luo X³, Ji Q³, Lu C³, He C⁴, Wang P³.

Abstract

OBJECTIVE:

To explore the effects of therapeutic ultrasound with sham or no intervention on pain, physical function and safety outcomes in patients with knee osteoarthritis.

DATA SOURCES:

This systematic review was searched on CENTRAL, EMBASE, MEDLINE, CINAHL, Physiotherapy Evidence Database, Open Gray on 4 September 2015. Trials included randomized controlled trials that compared therapeutic ultrasound with a sham or no intervention in patients with osteoarthritis of the knee.

REVIEW METHODS:

Eligible trials and extracted data were identified by two independent investigators. Standardized mean differences (SMDs) and 95% confidence interval (CI) were calculated for pain and physical function outcomes. Heterogeneity was assessed by the I^2 test and inverse-variance random-effects analysis was applied to all trials.

RESULTS:

Ten randomized controlled trials (645 patients) met the inclusion criteria. Therapeutic ultrasound showed a positive effect on pain (SMD = -0.93, 95% CI = -1.22 to -0.64, $p < 0.01$, p for heterogeneity = 0.12, $I^2 = 42\%$). For physical function, therapeutic ultrasound was advantageous for reducing Western Ontario and McMaster Universities physical function score (SMD = -0.37, 95% CI = -0.73 to -0.01, $p = 0.04$, p for heterogeneity = 0.94, $I^2 = 0\%$). In terms of safety, no occurrence of adverse events caused by therapeutic ultrasound was reported in any trial.

CONCLUSION:

The authors suggested that therapeutic ultrasound is beneficial for reducing knee pain and improving physical functions in patients with knee osteoarthritis and could be a safe treatment.

© The Author(s) 2015.

KEYWORDS:

Knee; meta-analysis; osteoarthritis; systematic review; ultrasonic therapy

PMID: 26451008