

ABSTRACTS

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1. LUMBAR SPINE

Facet tropisms

Is lumbar facet joint tropism developmental or secondary to degeneration? An international, large-scale multicenter study by the AOSpine Asia Pacific Research Collaboration Consortium

Dino Samartzis^{Email author}, and Richard Williams^{Email author} Et al.
*Scoliosis and Spinal Disorders*2016**11**:9

Background

Facet joint tropism is asymmetry in orientation of the bilateral facets. Some studies have shown that tropism may increase the risk of disc degeneration and herniations, as well as degenerative spondylolisthesis (DS). It remains controversial whether tropism is a pre-existing developmental phenomena or secondary to progressive remodeling of the joint structure due to degenerative changes. As such, the following study addressed the occurrence of tropism of the lower lumbar spine (i.e. L3–S1) in a degenerative spondylolisthesis patient model.

Methods

An international, multi-center cross-sectional study that consisted of 349 patients with single level DS recruited from 33 spine institutes in the Asia Pacific region was performed. Axial MRI/CT from L3–S1 were utilized to assess left and right facet joint sagittal angulation in relation to the coronal plane. The angulation difference between the bilateral facets was obtained. Tropism was noted if there was 8° or greater angulation difference between the facet joints. Tropism was noted at levels of DS and compared to immediate adjacent and distal non-DS levels, if applicable, to the index level. Age, sex-type and body mass index (BMI) were also noted and assessed in relation to tropism.

Results

Of the 349 subjects, there were 63.0 % females, the mean age was 61.8 years and the mean BMI was 25.6 kg/m². Overall, 9.7, 76.5 and 13.8 % had L3–L4, L4–L5 and L5–S1 DS, respectively. Tropism was present in 47.1, 50.6 and 31.3 % of L3–L4, L4–L5 and L5–S1 of levels with DS, respectively. Tropism involved 33.3 to 50.0 % and 33.3 to 58.8 % of the immediate adjacent and most distal non-DS levels from the DS level, respectively. Patient demographics were not found to be significantly related to tropism at any level ($p > 0.05$).

Conclusions

To the authors' knowledge, this is one of the largest studies conducted, in particular in an Asian population, addressing facet joint tropism. Although levels with DS were noted to have tropism, immediate adjacent and distal levels with no DS also exhibited tropism, and were not related to age and other patient demographics. This study suggests that facet joint tropism or perhaps subsets of facet joint orientation may have a pre-disposed orientation that may be developmental in origin or a combination with secondary changes due to degenerative/slip effects. The presence of tropism should be noted in all imaging assessments, which may have implications in treatment decision-making, prognostication of disease progression, and predictive modeling. Having a deeper understanding of such concepts may further elaborate on the precision phenotyping of the facets and their role in more personalized spine care. Additional prospective and controlled studies are needed to further validate the findings.

2. LBP

Explain pain not effective

Spine (Phila Pa 1976). 2016 Mar;41(6):455-62. doi: 10.1097/BRS.0000000000001268.

Cognitive Patient Education for Low Back Pain in Primary Care: A Cluster Randomized Controlled Trial and Cost-Effectiveness Analysis.

Werner EL¹, Storheim K, Løchting I, Wisløff T, Grotle M.
Author information

Abstract

STUDY DESIGN:

A pragmatic cluster randomized controlled trial in primary care.

OBJECTIVE:

The aim of this study was to estimate the clinical effectiveness and cost-effectiveness of a cognitive-based education program on patients with subacute or chronic low back pain (LBP) in primary care, compared to usual treatment, provided by general practitioners (GP) and physiotherapists (PT).

SUMMARY OF BACKGROUND DATA:

Patient education has been reported to have a favorable effect on patients with chronic musculoskeletal disorders. In this study, an "Explain Pain" model was adapted to fit into an ordinary clinical setting in Norwegian primary care.

METHODS:

Sixteen GPs and 20 PTs participated in the study and a total of 216 patients were recruited. The GPs and PTs were randomly assigned to provide either a cognitive patient education or usual treatment. All patients in both groups were provided with four consultations of 30 min with their provider during the study. In the intervention group the patients were educated according to a specific manual written for the purpose of this study.

RESULTS:

Eighty-one percent responded at 4-week, and 68% at the 12-month follow-up. There was a substantial improvement in function, pain, and sick leave in both groups. After 4 weeks the intervention group scored 0.51 RMDQ points lower than the control group (Beta -0.506 [95% CI -1.76-0.75]). After 12 months the intervention group scored 0.66 RMDQ points higher than the control group (Beta 0.66 [95% CI -0.56-1.88]). There was no significant difference in QALYs in the two treatment groups; the estimated difference was 0.005 (-0.016-0.027) in favor of the intervention.

CONCLUSION:

This study showed no clinical or health economic benefits as a result of adding a cognitive education program to usual treatment for patients with subacute and chronic LBP. Potential weaknesses such as a long recruiting period and potentially low compliance with the cognitive intervention warrant a careful interpretation of the results.

Questionnaire

Responsiveness and minimal important change of the pain self-efficacy questionnaire and short forms in patients with chronic low back pain

The Journal of Pain, 03/15/2016 Chiarotto A, et al.

The Pain Self-Efficacy Questionnaire (PSEQ) is a valid and reliable patient-reported instrument used to assess pain self-efficacy in patients with chronic low back pain (CLBP). MIC values were different for patients with low or high baseline values for all three instruments. The PSEQ and its short versions are adequately responsive instruments in patients with CLBP.

Methods

- The authors used a sample of 104 patients undergoing multimodal physical therapy designed to partly change pain self-efficacy beliefs.
- Responsiveness was assessed by testing 16 a-priori formulated hypotheses regarding effect sizes, areas under the curve, and correlations with changes in other instruments measuring other constructs.
- The MIC was calculated using an external anchor specific for pain self-efficacy and the receiver operator characteristic method.

Results

- The PSEQ and the PSEQ-4 met all hypotheses, while the PSEQ-2 met all but one.
- The MICs were: 5.5 for the PSEQ (9% of the scale range), 1.5 for PSEQ-2 (13% scale range) and PSEQ-4 (6% scale range).

PT classification system

Phys Ther. 2015 Dec 4.

Treatment-Based Classification System for Low Back Pain: Revision and Update.

Alrwaily M¹, Timko M², Schneider M³, Stevans J⁴, Bise C⁵, Hariharan K⁶, Delitto A⁷.

Author information**Abstract**

The treatment-based classification (TBC) system for the treatment of patients with low back pain (LBP) has been in use by clinicians since 1995. This perspective article describes how the TBC was updated by maintaining its strengths, addressing its limitations, and incorporating recent research developments. The current update of the TBC has 2 levels of triage: (1) the level of the first-contact health care provider and (2) the level of the rehabilitation provider. At the level of first-contact health care provider, the purpose of the triage is to determine whether the patient is an appropriate candidate for rehabilitation, either by ruling out serious pathologies and serious comorbidities or by determining whether the patient is appropriate for self-care management. At the level of the rehabilitation provider, the purpose of the triage is to determine the most appropriate rehabilitation approach given the patient's clinical presentation. Three rehabilitation approaches are described. A symptom modulation approach is described for patients with a recent-new or recurrent-LBP episode that has caused significant symptomatic features. A movement control approach is described for patients with moderate pain and disability status. A function optimization approach is described for patients with low pain and disability status. This perspective article emphasizes that psychological and comorbid status should be assessed and addressed in each patient. This updated TBC is linked to the American Physical Therapy Association's clinical practice guidelines for low back pain.

6. PELVIC GIRDLE

SI fusions

Eur Spine J. 2016 Mar 8.

Sacroiliac joint fusion for low back pain: a systematic review and meta-analysis.

Lingutla KK1, Pollock R2, Ahuja S3.

Author information

Abstract

BACKGROUND CONTEXT:

Although pain is generally regarded as originating in the lumbar spine, it has been estimated that in 15-30 % of patients, LBP originates from the sacroiliac joint (SIJ).

PURPOSE:

To determine whether sacroiliac joint fusion (SIJF) for LBP is effective in reducing pain when the SIJ is known to be the pain generator.

STUDY DESIGN/SETTING:

Systematic review and meta-analysis.

METHODS:

A systematic literature review and meta-analysis was performed of observational studies describing outcome of SIJF in patients with LBP. Outcome measures were VAS pain, ODI, SF-36 PCS/MCS and Majeed score. The following databases were searched: PubMed, Web of Science, Embase, Medline and Google scholar. The methodological quality of selected studies was assessed using the National Heart Lung and Blood Institute case series quality assessment tool. Meta-analysis was used to combine the studies for each outcome and forest plots were prepared. Outcomes were expressed as mean difference (MD).

RESULTS:

Six studies were included in the meta-analysis with a mean follow-up of 17.6 months. All outcomes showed statistical and clinical improvement (VAS pain MD: 54.8; 95 % CI 48.6, 61.0; n = 380; p < 0.001, ODI MD: 14.5; 95 % CI 8.4, 20.6; n = 102; p < 0.001, SF-36 PCS MD: -19.5; 95 % CI -24.7, -14.2; n = 140; p < 0.001, SF-36 MCS MD: -8.5; 95 % CI -12.9, -4.1; n = 198; p < 0.001 and Majeed score MD: -35.4; 95 % CI -48.5, -22.2; n = 140; p < 0.001).

CONCLUSIONS:

SIJF appears to be a satisfactory procedure for alleviating pelvic girdle pain.

KEYWORDS: Fusion; Low back pain; Meta-analysis; Outcome; Pelvic girdle pain; Sacroiliac joint

PMID:26957096

7. PELVIC ORGANS/WOMAN'S HEALTH

Red meat and menstruation

Red meat consumption linked to earlier onset of girls' menstrual cycles

University of Michigan Regents News, 03/14/2016

Girls who eat red meat often start their periods on average five months earlier than those who don't. Conversely, girls who consume fatty fish like tuna and sardines more than once a week have their first menstrual cycle, or menarche, significantly later than those who eat it once a month or less, according to research by the University of Michigan. The investigators from the U-M School of Public Health measured the usual diet of 456 girls 5-to-12 years old in Bogota, Colombia, before they had started menstruating. The girls were then followed for just under six years. During this time, they were asked whether they had had their first period. The girls were part of the Bogota School Children Cohort, a longitudinal research project that has examined many issues of nutrition and health. Red meat consumed by the girls ranged from less than four times a week to twice a day. The girls who ate the most red meat started their periods at a median age of 12 years 3 months, whereas those who ate it less frequently started at 12 years 8 months. Those who ate fatty fish most frequently began at 12 years 6 months. Five months may not sound like a lot but it is a significant number when talking about a population study, the researchers said.

Pregnancy and periodontitis

Quintessence Int. 2016;47(3):193-204. doi: 10.3290/j.qi.a34980.

Adverse pregnancy outcomes and periodontitis: A systematic review and meta-analysis exploring potential association.

Corbella S, Taschieri S, Del Fabbro M, Francetti L, Weinstein R, Ferrazzi E.

Abstract**OBJECTIVE:**

The correlation between periodontal status and systemic conditions, among them pregnancy, is widely described in the scientific literature. The aim of the present systematic review of the literature was to evaluate periodontal diseases as an independent risk factor for adverse pregnancy outcomes.

DATA:

Case-control studies reporting pregnancy outcomes and periodontal status of the subjects were included. Risk of bias evaluation was performed using a tool developed by the Cochrane Bias Methods Group. After risk of bias evaluation of included studies, a meta-analysis was performed computing the Risk Ratio (RR) for each pregnancy outcome.

SOURCES:

Electronic databases (MedLine, Embase, Cochrane Central) were searched after preparation of an appropriate search string.

STUDY SELECTION:

The search resulted in 422 entries that were screened. After application of inclusion and exclusion criteria, a total of 22 studies were included in the review accounting for a total of 17,053 subjects. The computed RR for periodontitis was 1.61 for preterm birth evaluated in 16 studies ($P < .001$), 1.65 for low birthweight evaluated in 10 studies ($P < .001$), and 3.44 for preterm low birthweight evaluated in four studies.

CONCLUSION:

The present systematic review reported a low but existing association between periodontitis and adverse pregnancy outcomes. This assumption is the result of proper corrections of biased methodologies and of heterogeneity of studies. (.

PMID:

26504910

Vulvodynia

J Midwifery Womens Health. 2012 May-Jun;57(3):231-40. doi: 10.1111/j.1542-2011.2012.00162.x. Epub 2012 May 3.

Assessment and management options for women with vulvodynia.

Cox KJ¹, Neville CE.

Author information

Abstract

Vulvodynia is a chronic pain disorder that affects sexual function in adult women. The etiology of vulvodynia is poorly understood, making the condition difficult to diagnose and treat. Women with vulvodynia often suffer significant psychological distress and have difficulty finding a compassionate and supportive health care provider. This article reviews the etiology, diagnosis, educational strategies, and treatment options for vulvodynia with the aim of increasing primary care providers' knowledge and assessment skills. Physical therapy and other nonsurgical treatment modalities are explored in depth.

PMID:22594863

Pelvic adhesions

Ultrasound Obstet Gynecol. 2015 Feb;45(2):223-8. doi: 10.1002/uog.14628. Epub 2014 Dec 26.

Prevalence of pelvic adhesions on ultrasound examination in women with a history of Cesarean section.

Moro F¹, Mavrellos D, Pateman K, Holland T, Hoo WL, Jurkovic D.

Author information

Abstract

OBJECTIVES:

To investigate the prevalence and location of pelvic adhesions in women with a history of Cesarean section and to identify risk factors for their formation and symptoms associated with their presence.

METHODS:

This was a prospective observational study of women in whom one or more Cesarean sections had been performed > 12 months previously and who attended for a gynecological ultrasound examination. In all women, both transvaginal and transabdominal scans were performed in order to identify the presence of pelvic adhesions. Medical and surgical history was recorded and a structured questionnaire was used to enquire about any history of pelvic pain and urinary symptoms.

RESULTS:

A total of 308 women were recruited into the study. On ultrasound examination, 139 (45.1% (95% CI, 39.7-50.7%)) women showed evidence of adhesions within the pelvis. Adhesions in the vesicouterine pouch were the most common and were found in a total of 79 (25.6% (95% CI, 20.7-30.5%)) women. In women with a history of no surgery other than Cesarean section(s) (n = 220), an increasing number of Cesarean sections (odds ratio (OR) 3.4 (95% CI, 2.1-5.5)) and a postoperative wound infection (OR 11.7 (95% CI, 3.5-39.5)) increased the likelihood of adhesions developing in the anterior pelvic compartment. There was a significant association between the presence of anterior compartment adhesions and chronic pelvic pain. Multivariable logistic regression analysis identified anterior abdominal wall adhesions (OR 2.4 (95% CI, 1.0-5.9)) and any adhesions present on ultrasound scan (OR 2.6 (95% CI, 1.2-5.7)) as independent predictors of chronic pelvic pain.

CONCLUSIONS:

Pelvic adhesions are present in more than a third of women with a history of Cesarean section and they are associated with chronic pelvic pain.

KEYWORDS: Cesarean section; surgical adhesions; ultrasound

PMID:25042444

Manual therapy and infertility

Altern Ther Health Med. 2015 Feb 17. pii: at5233.

Ten-year Retrospective Study on the Efficacy of a Manual Physical Therapy to Treat Female Infertility.

Rice AD, Patterson K, Wakefield LB, Reed ED, Breder KP, Wurn BF, King Iii R, Wurn LJ.

Abstract

Background • Female infertility is a complex issue encompassing a wide variety of diagnoses, many of which are caused or affected by adhesions.

Objectives • The study intended to examine the rates of successful treatment of infertile women using a protocol of manual physical therapy to address underlying adhesive disease leading to infertility.

Methods • The research team designed a retrospective chart review. **Setting** • The study took place in a private physical therapy clinic.

Participants • Participants were 1392 female patients who were treated at the clinic between the years of 2002 and 2011. They had varying diagnoses of infertility, including occluded fallopian tubes, hormonal dysfunction, and endometriosis, and some women were undergoing in vitro fertilization (IVF). **Intervention** • All patients underwent whole-body, patient-centered treatments that used a protocol of manual physical therapy, which focused on restoring mobility and motility to structures affecting reproductive function.

Outcome Measures • Improvements demonstrated in the condition(s) causing infertility were measured by improvements in tubal patency and/or improved hormone levels or by pregnancy.

Results • The results included a 60.85% rate of clearing occluded fallopian tubes, with a 56.64% rate of pregnancy in those patients. Patients with endometriosis experienced a 42.81% pregnancy rate. The success rate was 49.18% for lowering elevated levels of follicle stimulating hormone (FSH), with a 39.34% pregnancy rate in that group, and 53.57% of the women with polycystic ovarian syndrome (PCOS) achieved pregnancy. The reported pregnancy rate for patients who underwent IVF after the therapy was 56.16%. The results also suggested that the treatment was effective for patients with premature ovarian failure (POF).

Conclusion • The manual physical therapy represented an effective, conservative treatment for women diagnosed as infertile due to mechanical causes, independent of the specific etiology.

PMID: 25691329

8. VISCERA

Vit. D and IBS

Intern Emerg Med. 2016 Mar 3.

Vitamin D deficiency in patients with either rheumatic diseases or inflammatory bowel diseases on biologic therapy.

Bruzzese V¹, Zullo A², Piacchianti Diamanti A³, Ridola L⁴, Lorenzetti R⁵, Marrese C⁵, Scolieri P⁵, De Francesco V⁶, Hassan C⁵, Migliore A⁷, Laganà B³.

Author information

Abstract

Vitamin D deficiency has been reported in patients with chronic inflammatory conditions, such as rheumatic and inflammatory bowel diseases (IBD). We evaluated the role of biologic therapy on vitamin D, calcium and parathormone (PTH) levels. This cross-sectional study enrolled consecutive patients with either rheumatic diseases or IBD who underwent an ambulatory visit. Patients receiving vitamin D/calcium supplementation were excluded. Vitamin D deficiency or insufficiency was diagnosed when values were <20 ng/mL and 21-29 ng/ml, respectively. Patients were sub-grouped according to biologic therapy. A multivariate analysis was performed. Two-hundred patients, including 136 with a rheumatic disease (M/F 37/99; mean age 60.7 ± 12.9 years) and 64 with IBD (M/F 41/23; Mean age 49.6 ± 13.1 years) were enrolled. Vitamin D deficiency/insufficiency was detected in as many as 63.5 % patients, being 61.8 and 67.2 % in patients with either rheumatic diseases or IBD, respectively. The prevalence of vitamin D deficiency/insufficiency was higher in those receiving biologics than other therapies (78.3 vs 43.2 %; p < 0.0001), in either rheumatic diseases (78.7 vs 41 %; p < 0.0001) or IBD (75 vs 50 %; p = 0.03) group. At multivariate analysis, only biologic therapy was independently associated with vitamin D deficit (OR 4.61; p = 0.001). Patients with vitamin D deficiency/insufficiency had hypocalcemia more frequently than controls (22.8 vs 10.9 %; p = 0.03), while PTH values did not differ significantly. This study finds that the prevalence of vitamin D deficiency/insufficiency was very high in patients with either rheumatic diseases or IBD receiving a biologic therapy.

KEYWORDS: Biologic therapy; Inflammatory bowel disease; Rheumatic disease; Vitamin D
PMID:26939587

IBS and celiacs disease

Mol Med Rep. 2011 May-Jun;4(3):403-5. doi: 10.3892/mmr.2011.466. Epub 2011 Mar 22.

The prevalence of celiac disease in patients with irritable bowel syndrome.

El-Salhy M¹, Lomholt-Beck B, Gundersen D.

Author information**Abstract**

The diagnosis of irritable bowel syndrome (IBS) is based on symptom assessment such as the Rome III criteria. It is sometimes difficult to clinically distinguish IBS from adult-onset celiac disease (CD). Individuals with CD presenting with relatively vague abdominal symptoms are at risk of been dismissed as having IBS. This study aimed to investigate the prevalence of patients with CD among those that fulfill the Rome III criteria for IBS from among patients referred to the gastroenterology section of our hospital over the last 5 years. The study included a total of 968 patients with an average age of 32 years (range 18-59 years). Females constituted 95% of all patients. Duodenal biopsies were obtained during standard gastroscopy. Sections from these biopsies were stained with haematoxylin and eosin and immunostained for human leucocytes CD45 using the avidin-biotin complex (ABC) method. The sections were then histopathologically examined. Four patients had CD: one with Marsh type 3b, and 3 with Marsh type 1. All four of these patients were positive for tissue transglutminase antibodies (anti-t-TG) IgA and were females aged 24, 20, 36 and 38 years. These 4 patients fulfilled the Rome III criteria for the subtype IBS-diarrhea. This amounts to a prevalence of 0.4% of CD in IBS patients. The present findings support the notion that IBS patients should be routinely examined for CD. This applies to all subtypes of IBS.

PMID:21468583

Adherence to a GF diet

Appetite. 2016 Feb 26;101:55-61. doi: 10.1016/j.appet.2016.02.155.

Coeliac disease in adolescence: Coping strategies and personality factors affecting compliance with gluten-free diet.

Wagner G¹, Zeiler M², Grylli V², Berger G³, Huber WD³, Woeber C⁴, Rhind C⁵, Karwautz A⁶.
Author information

Abstract

OBJECTIVES:

Patients suffering from a chronic condition such as coeliac disease (CD) need to develop coping strategies in order to preserve emotional balance and psychosocial functioning while adhering to their obligatory life-long gluten free diet (GFD). However, this can be particularly challenging for adolescents and may lead to dietary transgressions. Little is currently known about the influence of coping strategies and personality factors on dietary compliance. This study aims to explore these factors for the first time in adolescents with biopsy-proven CD.

STUDY DESIGN:

We included 281 adolescents with CD and 95 healthy controls. We classified patients according to their GFD adherence status (adherent vs. non-adherent) and assessed coping strategies using the KIDCOPE and personality traits using the Junior-Temperament and Character Inventory (J-TCI).

RESULTS:

Adolescents with CD adherent to GFD used less emotional regulation and distraction as coping strategies than non-adherent patients. In terms of personality traits, adherent patients differed from non-adherent patients with respect to temperament, but not with respect to character, showing lower scores in novelty seeking, impulsivity and rule transgressions and higher scores in eagerness with work and perfectionism compared to non-adherent patients. No differences were found between healthy controls and adherent CD patients across these personality traits.

CONCLUSIONS:

Coping strategies and personality traits differ in adolescent patients with CD adherent to GFD from those not adherent, and may therefore relate to risk or protective factors in adherence. Targeting coping and temperament using psychological interventions may therefore be beneficial to support adolescents with CD and optimise their adherence to GFD.

KEYWORDS: Coeliac disease; Coping strategies; Dietary transgressions; Personality
PMID:26924559

12 A. WHIPLASH

Body awareness training

Disabil Rehabil. 2016 Mar;38(5):442-51. doi: 10.3109/09638288.2015.1044036. Epub 2015 May 8.

Basic body awareness therapy or exercise therapy for the treatment of chronic whiplash associated disorders: a randomized comparative clinical trial.

Seferiadis A^{1,2,3}, Ohlin P², Billhult A², Gunnarsson R^{2,3,4}.

Author information

Abstract

PURPOSE:

Chronic whiplash-associated disorders (WAD) incur both costs and suffering. Treatments that can relieve chronic WAD are therefore needed. Exercise therapy (ET) has been shown to provide pain relief. Another often used treatment for chronic pain in Scandinavia is basic body awareness therapy (BAT). We compared the effectiveness of 10 weeks of twice-weekly, 90-min sessions of either ET or BAT in a randomized comparative trial.

METHOD:

We recruited 113 patients suffering from chronic WAD grades I-III and several years' duration of symptoms in a primary health care setting. 57 were allocated to ET and 56 to BAT. Primary outcome measures were Neck Disability Index and SF-36 v.2.

RESULTS:

From baseline to post-treatment, the BAT group increased their physical functioning (median 5, IQR = 15) more than the ET group (median = 0, IQR = 15), $p = 0.032$, effect size -0.54. Three months after the end of treatment, the BAT group had less bodily pain ($m = 17.5$, 95% CI 6.9-17.6) than the ET group ($m = 4.9$, 95% CI -0.1 to 9.8), $p = 0.044$, effect size -0.4. The BAT group had also increased their social functioning ($m = 13.3$, 95% CI 6.6-19.9) more than the ET group ($m = 3.5$, 95% CI -3 to 9.9), $p = 0.037$, effect size -0.41. No statistically significant differences between groups were found for the change of other outcomes. No serious adverse effects were found in either groups.

CONCLUSIONS:

The present trial indicates that BAT led to greater improvements than ET for the patients with chronic WAD. Implications for Rehabilitation Chronic whiplash-associated disorders are disabling and incur great costs to society often through inability to work. Exercise therapy (ET) may alleviate symptoms of chronic WAD. Basic body awareness therapy (BAT) is often a component of multimodal pain rehabilitation programs. In this randomized comparative trial, BAT increased physical functioning and led to greater pain reduction and social functioning 3 months after the end of treatment.

KEYWORDS: Body awareness therapy; Neck Disability Index; SF-36; exercise; whiplash
PMID:25955823

13. CRANIUM/TMJ

Oral appliance and sleep apnea

J Oral Rehabil. 2016 Mar 9. doi: 10.1111/joor.12385.

Obstructive sleep apnoea: patients' experiences of oral appliance treatment.

Nordin E¹, Stenberg M², Tegelberg Å^{1,2,3}.

Author information

Abstract

Over the past few decades, there has been a pronounced increase in the number of patients being treated by general dental practitioners for obstructive sleep apnoea (OSA). The purpose of this study was to survey the care and patient experiences and the self-reported effectiveness of OSA treatment with an oral appliance (OA) incorporating mandibular advancement. The design was a retrospective, cross-sectional study, with follow-up between 6 months to 1 year after commencement of treatment. A survey form was posted to 1150 subjects, identified in the regional register over a 1-year period as having been treated with an OA for OSA. The questionnaire comprised 70 questions and assertions in various domains, such as general health/lifestyle, changes in symptoms/quality of life and sleep-related experiences, daytime sleepiness, changes in life situation, evaluation of treatment and the value of treatment. The overall response rate was 64% (n = 738). Treatment with OA gave relief of symptoms in 83% of the respondents. Quality of life, somatic and cognitive symptoms improved significantly in patients who used the appliance frequently (P < 0.001). Daytime sleepiness decreased significantly (P < 0.001). Treatment satisfaction and willingness to recommend the similar treatment to a friend were high (>85%). OA treatment of OSA by general dental practitioners is a safe procedure. Most of the survey respondents experienced relief of symptoms. Those who used their appliance frequently reported improvement in quality of life, somatic and cognitive symptoms. Excessive daytime sleepiness was reduced in the majority of the patients under treatment.

KEYWORDS: PROM ; dentistry; effectiveness; follow-up; questionnaire; treatment
PMID: 26969447

Orthodontics and TMJ

Am J Orthod Dentofacial Orthop. 2016 Mar;149(3):339-48. doi: 10.1016/j.ajodo.2015.08.016.

Congenitally missing maxillary lateral incisors: Long-term periodontal and functional evaluation after orthodontic space closure with first premolar intrusion and canine extrusion.

Rosa M¹, Lucchi P², Ferrari S³, Zachrisson BU⁴, Caprioglio A⁵.

Author information

Abstract

INTRODUCTION: The aims of this investigation were to evaluate associations between orthodontic space closure (including first premolar intrusion and canine extrusion for esthetic reasons) and periodontal tissue deterioration over a 10-year period in subjects with one or both missing maxillary lateral incisors and to investigate the occurrence of signs or symptoms of temporomandibular disorder (TMD).

METHODS: This was a retrospective cohort study comprising patients treated by the same orthodontist. The agenesis group included 26 consecutive adolescent and young adult patients (9 male, 17 female) treated with space closure. The control group consisted of 32 orthodontic patients (12 male, 20 female) with no missing teeth and no need for extractions. In the agenesis group, full-mouth probing pocket depths and bleeding on probing were recorded at 6 locations for each of 657 teeth (3942 periodontal sites). In the control group, comparative data were collected for the maxillary first molars, premolars, canines, and lateral incisors, a total of 264 teeth (1584 periodontal sites). Mobility and gingival recession were also evaluated. Patients in both groups completed questionnaires concerning symptoms related to TMD.

RESULTS: The full-mouth assessments in the agenesis group generally demonstrated periodontally healthy conditions, with probing depths below 4 mm and few bleeding sites. Some slight recessions were found, mostly on molars and second premolars, and there was normal mobility of first premolars that substituted for canines. Comparisons between the agenesis and control groups showed no statistically significant differences for the maxillary teeth regarding increased pocket depth (≥ 4 mm) or increased mobility. Interproximal sites in the agenesis group showed less bleeding on probing than in the control group; this was statistically significant. Anterior teeth in the agenesis group did not show any more recession than in the controls. In addition, we observed no difference in signs or symptoms between the 2 groups; this might be due to the limited sample size or the drawbacks of the surveys of TMD through subjects' recall. Thus, the long-term periodontal tissue health and the incidence of dysfunction or TMD signs were similar in the space-closure agenesis group and in the control group of nonextraction orthodontic patients.

CONCLUSIONS: Orthodontic space closure including first premolar intrusion and canine extrusion in patients with missing lateral incisors does not incur risks for periodontal tissue deterioration or TMD in the long term.

PMID:26926021

14. HEADACHES

Phenotypes

J Headache Pain. 2016 Dec;17(1):26. doi: 10.1186/s10194-016-0616-y. Epub 2016 Mar 15.

Phenotypic features of chronic migraine.

Yalın OÖ¹, Uluduz D², Özge A³, Sungur MA⁴, Selekler M⁵, Siva A².

Author information

Abstract

BACKGROUND:

Chronic migraine is a disabling, under-recognized, and undertreated disorder that increases health burdens. The aim of this study was to evaluate phenotypic features and the relevance of accompanying symptoms of migraine attacks in chronic migraine.

METHOD:

This study was conducted as part of an ongoing Turkish Headache Database Study investigating the clinical characteristics and outcomes of headache syndromes in the Turkish population. The electronic database was examined retrospectively, and 835 patients with chronic migraine were included.

RESULTS:

Patient group consisted of 710 women and 125 men (85 and 15 %, respectively). Mean patient age was 36.8 ± 13.5 years, median value of migraine onset was 60 months (18-120), median headache frequency was 25 days per month (16-30), median of attack duration was 12 h (4-24), and median of intensity was eight (7-9). Increasing headache days per month were inversely related with the presence of nausea, vomiting, phonophobia, and photophobia. Longer duration of headache (months) and higher visual analog scale (VAS) for headache intensity were associated with all accompanying symptoms. Phonophobia, nausea, photophobia, and vomiting were the most frequent accompanying symptoms (experienced by 80.2, 77.6, 71.2, and 40.9 % of patients, respectively). Osmophobia was also frequent in chronic migraine patients (53.4 %) and was closely associated with other accompanying symptoms. Vertigo and dizziness were observed less frequently, and they were not associated with accompanying symptoms.

CONCLUSION:

Phenotype of chronic migraine may be associated with the course of chronification. Duration of illness and attack intensity were closely related with the presence of accompanying symptoms, although headache frequency was found to be inversely related to the presence of accompanying symptoms. Osmophobia was also a frequent symptom and was closely related with other accompanied symptoms, unlike vertigo and dizziness. Inclusion of osmophobia into the diagnostic criteria might improve accurate diagnosis of chronic migraine.

KEYWORDS: Accompanying symptoms; Chronic migraine; Chronification; Phenotype
PMID: 26975363

Thalamus connectivity dysfunction

J Headache Pain. 2015 Dec;17(1):17. doi: 10.1186/s10194-016-0610-4. Epub 2016 Feb 27.

Altered effective connectivity of posterior thalamus in migraine with cutaneous allodynia: a resting-state fMRI study with granger causality analysis.

Wang T^{1,2}, Chen N³, Zhan W⁴, Liu J², Zhang J¹, Liu Q¹, Huang H¹, He L³, Zhang J^{5,6}, Gong Q⁷.
[Author information](#)

Abstract

BACKGROUND: Most migraineurs develop cutaneous allodynia (CA) during migraine, and the underlying mechanism of CA in migraine is thought to be sensitization of the third-order trigeminovascular neurons in the posterior thalamic nuclei. This study aimed to investigate whether the ascending/descending pathway associated with the thalamus is disturbed in migraineurs with CA (MWCA) using effective connectivity analysis of resting-state functional magnetic resonance imaging.

METHODS: Thirty four migraineurs without aura (14 MWCA and 20 migraineurs without CA (MWOCA)) and 25 matched healthy controls (HC) were recruited in the study. The effective connectivity pathways associated with the posterior thalamus (PTH) were investigated using the Granger causality analysis. We chose bilateral PTH as two individual seeds, and compared MWCA with MWOCA and HC, respectively. Spearman correlation analysis was performed to test the correlation between the abnormal effective connectivity and the allodynia severity of MWCA.

RESULTS: Compared with MWOCA, MWCA showed decreased inflows from the left limbic regions and dorsal medial prefrontal cortex (dmPFC) to the ipsilateral PTH, as well as increased inflow from the right ventral medial prefrontal cortex (vmPFC) to the ipsilateral PTH; no significantly different outflows from the bilateral PTH to other regions were found. Compared with HC, MWCA showed increased outflows from the left PTH to the bilateral vmPFC, decreased outflows from the right PTH to the bilateral temporoparietal areas, decreased inflow from the left parietooccipital area to the ipsilateral PTH, and increased inflows from the right dorsolateral prefrontal cortex and the bilateral temporoparietal areas to the right PTH. Correlation analyses revealed that the disturbed connectivities between PTH and cuneus, as well as PTH and middle frontal gyrus were associated with the allodynia severity of MWCA.

CONCLUSIONS: MWCA demonstrated disrupted effective connection pathways between the PTH and other cortical or subcortical regions that participated in multi-dimensional pain processing. Our findings highlight the dysfunctional ascending and descending pain network at the thalamic-level and may help to illuminate the possible pathophysiologic mechanisms of CA.

KEYWORDS: Cutaneous allodynia; Effective connectivity; Granger causality analysis; Migraine; Posterior thalamus; Resting-state functional magnetic resonance imaging

PMID: 26922333

Migraines variation

Cephalalgia. 2016 Mar 8. pii: 0333102416636055.

When does chronic migraine strike? A clinical comparison of migraine according to the headache days suffered per month.

Torres-Ferrús M¹, Quintana M², Fernandez-Morales J³, Alvarez-Sabin J², Pozo-Rosich P⁴.

Author information

Abstract

INTRODUCTION:

According to the IHCD-3 β classification, chronic migraine (CM) is headache occurring on 15 or more days/month. Episodic migraine (EM) can be divided into low frequency (LFEM) and high frequency (HFEM) depending on the headache days suffered per month.

METHODS:

We performed a clinical comparison of migraine characteristics according to monthly headache days suffered. Patients were divided into three groups: LFEM (1-9 headache days/month), HFEM (10-14 headache days/month) and CM (≥ 15 headache days/month).

RESULTS:

The analysis included 1109 patients. Previously reported differences between EM and CM were replicated. However, there were three times more clinical differences between LFEM and HFEM than between HFEM and CM (15 vs. 6). A new model that takes 10 headache days as a cut-off value for CM would have a minimally higher predictive capacity (72.8%) and no statistical differences (71.8%) when comparing it to the current classification.

CONCLUSIONS:

HFEM patients have few clinical differences compared with CM patients. This includes the poor outcomes regarding headache-related disability and impact on daily life. According to these findings, neurologists and headache specialists should consider that the emotional and functional impact in HFEM patients could be as disabling as in those with CM.

KEYWORDS: Headache; MIDAS; chronic migraine; disability; migraine

PMID: 26961321

Sex difference in HA's

Cephalalgia. 2016 Mar 11. pii: 0333102416637832.

Sex-, stress-, and sympathetic post-ganglionic-dependent changes in identity and proportions of immune cells in the dura.

McIlvried LA¹, Cruz JA², Borghesi LA², Gold MS³.

Author information

Abstract

AIM OF INVESTIGATION: Due to compelling evidence in support of links between sex, stress, sympathetic post-ganglionic innervation, dural immune cells, and migraine, our aim was to characterize the impacts of these factors on the type and proportion of immune cells in the dura.

METHODS: Dural immune cells were obtained from naïve or stressed adult male and female Sprague Dawley rats for flow cytometry. Rats with surgical denervation of sympathetic post-ganglionic neurons of the dura were also studied.

RESULTS: Immune cells comprise ~17% of all cells in the dura. These included: macrophages/granulocytes ("Macs"; 63.2% of immune cells), dendritic cells (0.88%), T-cells (4.51%), natural killer T-cells (0.51%), natural killer cells (3.08%), and B-cells (20.0%). There were significantly more Macs and fewer B- and natural killer T-cells in the dura of females compared with males. Macs and dendritic cells were significantly increased by stress in males, but not females. In contrast, T-cells were significantly increased in females with a 24-hour delay following stress. Lastly, Macs, dendritic cells, and T-cells were significantly higher in sympathectomized-naïve males, but not females.

CONCLUSIONS: It may not only be possible, but necessary to use different strategies for the most effective treatment of migraine in men and women.

KEYWORDS: Headache; autonomic; inflammation; meninges

PMID:26970607

Posture and HA's

Cervico-occipital Posture in Women With Migraine: A Case-Control Study

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Published: *Journal of Orthopaedic & Sports Physical Therapy*,
2016 **Volume:**0 **Issue:**0 **Pages:**1–25 **DOI:**10.2519/jospt.2016.6166

Study Design

Case-control study.

Background

Previous studies have assessed forward head posture in patients with migraine using photographs. To date no study has compared postural differences using both radiographs and photographs.

Objective

To determine the differences in head extension posture between women with migraine and healthy women assessed by radiographic and photographic measures.

Methods

Thirty-three women (age 32±11.3 years) with migraine and 33 matched controls (age 33±12.6) years old participated. High cervical angle (HCA: the angle formed between the most inferior line from the occipital surface to the posterior portion of C1 and the posterior surface of the odontoid process of C2) and the vertical distance between C0 and C1 (C0-C1) were measured with radiographs, whereas the cranio-vertebral (CV) angle was assessed with photographs using K-Pacs® and Corporis Pro 3.1® software, respectively.

Results

None of the outcomes differed significantly between women with migraine (HCA: 66.8°, 95%CI 64.2-68.1; CV: 46.1°, 95%CI 45.0-47.1; C0-C1: 8.6mm 95%CI 7.7-9.2) and controls (HCA: 67.9°, 95%CI 66.5-69.3; CV: 44.5°, 95%CI 43.2-45.7; C0-C1: 8.7mm, 95%CI 7.9-9.4). Different relationships between the frequency ($r=-0.42$; $P=0.01$, $R^2= 10\%$) of migraine and the HCA were found.

Conclusion

This study demonstrated that women with migraine did not exhibit forward head posture compared to women with no history of headache in either radiographic or photographic postural analysis. However, there was a weak association of the frequency of migraine attacks with a variation in the high cervical angle as assessed by radiographs.

Level of Evidence

Differential diagnosis/symptom prevalence, Level 4. *J Orthop Sports Phys Ther*, Epub 8 Mar 2016. doi:10.2519/jospt.2016.6166

Keyword: headache, photography, posture, radiography

19. GLENOHUMERAL/SHOULDER**Posterior shoulder capsule tightness**

J Sport Rehabil. 2016 Feb 26.

Effectiveness of Stretching on Posterior Shoulder Tightness and Glenohumeral Internal Rotation Deficit: A Systematic Review of Randomised Controlled Trials.

Mine K¹, Nakayama T, Milanese S, Grimmer K.
Author information

Abstract

CONTEXT:

Posterior shoulder tightness (PST) and glenohumeral internal rotation deficit (GIRD) are common physical impairments in overhead sports, such as baseball, cricket and tennis. PST is clinically measured by passive shoulder horizontal adduction with scapula stabilized in supine or side lying. GIRD is generally characterised as concurrent deficits of internal rotation (IR) and total arc of motion in dominant side. Although the mechanisms of PST and GIRD are not clear, it is speculated that they derive from tight posterior glenohumeral capsule and posterior muscles, such as posterior deltoid, infraspinatus and teres minor muscles. Some authors suggest that repetitive tensile stress to posterior structures in follow-through phase in throwing movements could lead to inflammation, scar formation and subsequent tightness in posterior tissues, resulting in PST and GIRD. Since both PST and GIRD are thought to reflect tightness of posterior structures in the shoulder, the term PST is occasionally used instead of GIRD in order to describe decreased IR ROM.

PMID: 26919476

25. WRIST AND HAND**PT and Dupuytren's**

Plastic and Reconstructive Surgery - Global Open:
February 2016 - Volume 4 - Issue 2 - p e629
doi: 10.1097/GOX.0000000000000565

Collagenase Dupuytren Contracture: Achieving Single Treatment Success with a Hand Therapist-Based Protocol

Malafa, Menyoli M. MD; Lehrman, Craig MD; Criley, Jerry W. MS, OTR/L, CHT; Amirlak, Bardia MD, FACS
[Open Access](#)

Abstract

Background: Surgery remains the gold standard in the treatment of Dupuytren contracture but is technically demanding, carries significant risk of complications, and requires prolonged recovery time. Collagenase injection is an efficacious alternative to surgery; however, contracture release often requires multiple treatments spaced a month apart. We report our experience with a new collagenase treatment protocol aimed to minimize the total treatment time per joint contracture.

Methods: We performed a single institution retrospective review of patients with Dupuytren contracture treated with collagenase using our protocol from 2011 to 2013. Patients returned 24 hours after collagenase injection for cord manipulation by a certified hand therapist while under digital block. Treatment success was defined as reduction in contracture to 5 degrees or less. Successfully treated joints were evaluated for recurrence (>10 degrees contracture) at 30-day and 6-month follow-up appointments. Serious adverse events, including skin tears, were recorded.

Results: Success was achieved in 36 of 47 treated joints (76.6%) after a single injection. There were 2 recurrences in 32 joints at 30-day follow-up (6.2%) and no recurrences in 17 joints available at 6-month follow-up. Skin tears were the only serious adverse event occurring in 18 of 47 cord ruptures (38.3%). All healed secondarily without complication.

Conclusions: Our protocol preserves treatment efficacy while maximizing efficiency. Achieving successful cord rupture with a single injection allows earlier return of function, reduced cost of treatment, and increased convenience for the patient. Patients, particularly those with greater contractures, should be counseled regarding the risk of skin tear during cord manipulation.

27. HIP**Hip rotation measurement**

J Sport Rehabil. 2016 Feb 26.

Reliability and Validity of a Novel Approach to Measure Hip Rotation.

Aefsky B¹, Fleet N, Myers H, Butler RJ.

Author information

Abstract

CONTEXT:

Currently, hip rotation range of motion (ROM) is clinically measured in an open kinetic chain in either seated or prone positions using passive or active range of motion. However, during activities of daily living and during sports participation the hip must be able to rotate in a loaded position and there is no standard measurement for this.

OBJECTIVE:

To determine if a novel method for measuring hip rotation in weight bearing will result in good to very good reliability as demonstrated by an intraclass correlation coefficient (ICC) of >0.80. Secondly, to investigate if weight bearing hip measurements will result in significantly reduced hip range of motion as compared to non-weightbearing methods.

DESIGN:

Repeated Measures.

SETTING:

outpatient sports physical therapy clinic.

PARTICIPANTS:

Twenty healthy participants (10 male, 10 female) were recruited for hip rotation measurements.

METHODS:

Three trials of both internal and external rotation were measured in sitting, prone, and weight bearing. Two therapists independently measured each participant on the same day. The participants returned the following day to repeat the same measurements with the same two therapists.

MAIN OUTCOME MEASURES:

Degrees of hip internal and external rotation measured in prone, sitting, and loaded positions.

RESULTS:

In general, the measurement of hip range of motion across the different conditions was reliable. The intrarater reliability ranged from 0.67-0.95 while interrater reliability ranged from 0.59-0.96. Interrater reliability was improved when values were averaged across the measures (0.75-0.97). ICC for active loaded range of motion ranged from 0.67 to 0.81 while interrater ICC was 0.53 to 0.87. In general, prone hip range of motion was greater than supine and supine was greater than loaded.

CONCLUSIONS:

Loaded hip rotation can be measured in a clinical setting with moderate to good reliability. The rotation range of motion of a loaded hip can be significantly decreased compared to unloaded motion.

PMID: 26918823

Innominate position for hip

[BMC Musculoskelet Disord.](#) 2016 Mar 16;17(1):131. doi: 10.1186/s12891-016-0982-2.

Does hemipelvis structure and position influence acetabulum orientation?

[Musielak B](#)¹, [Jóźwiak M](#)², [Rychlik M](#)³, [Chen BP](#)², [Idzior M](#)², [Grzegorzewski A](#)⁴.

[Author information](#)

Abstract

BACKGROUND:

Although acetabulum orientation is well established anatomically and radiographically, its relation to the innominate bone has rarely been addressed. If explored, it could open the discussion on patomechanisms of such complex disorders as femoroacetabular impingement (FAI). We therefore evaluated the influence of pelvic bone position and structure on acetabular spatial orientation. We describe this relation and its clinical implications.

METHODS:

This retrospective study was based on computed tomography scanning of three-dimensional models of 31 consecutive male pelvises (62 acetabulums). All measurements were based on CT spatial reconstruction with the use of highly specialized software (Rhinoceros). Relations between acetabular orientation (inclination, tilt, anteversion angles) and pelvic structure were evaluated. The following parameters were evaluated to assess the pelvic structure: iliac opening angle, iliac tilt angle, interspinous distance (ISD), intertuberous distance (ITD), height of the pelvis (HP), and the ISD/ITD/HP ratio. The linear and nonlinear dependence of the acetabular angles and hemipelvic measurements were examined with Pearson's product - moment correlation and Spearman's rank correlation coefficient. Correlations different from 0 with $p < 0.05$ were considered statistically significant.

RESULTS:

Comparison of the axis position with pelvis structure with orientation in the horizontal plane revealed a significant positive correlation between the acetabular anteversion angle and the iliac opening angle ($p = 0.041$ and 0.008 , respectively). In the frontal plane, there was a positive correlation between the acetabular inclination angle and the iliac tilt angle ($p = 0.025$ and 0.014 , respectively) and the acetabular inclination angle and the ISD/ITD/HP ratio (both $p = 0.048$).

CONCLUSIONS:

There is a significant correlation of the hemipelvic structure and acetabular orientation under anatomic conditions, especially in the frontal and horizontal planes. In the anteroposterior view, the more tilted-down innominate bone causes a more caudally oriented acetabulum axis, whereas in the horizontal view this relation is reversed. This study may serve as a basis for the discussion on the role of the pelvis in common disorders of the hip.

KEYWORDS: Computed tomography; Hip joint; Pelvic bone; Sacral base plane; Spatial orientation

PMID: 26984181

Ober test more for prox. Hip structures than IT band

Am J Sports Med. 2016 Mar;44(3):696-701. doi: 10.1177/0363546515621762. Epub 2016 Jan 11.

An Anatomic Investigation of the Ober Test.

Willett GM¹, Keim SA², Shostrom VK³, Lomneth CS².

Author information

Abstract

BACKGROUND: Recent studies have questioned the importance of the iliotibial band (ITB) in lateral knee pain. The Ober test or modified Ober test is the most commonly recommended physical examination tool for assessment of ITB tightness. No studies support the validity of either Ober test for measuring ITB tightness.

PURPOSE/HYPOTHESIS: The purpose of this study was to assess the effects of progressive transection of the ITB, gluteus medius and minimus (med/min) muscles, and hip joint capsule of lightly embalmed cadavers on Ober test results and to compare them with assessment of all structures intact. In addition, thigh position change between gluteus med/min transection and hip capsule transection was also assessed for both versions of the Ober test. It was hypothesized that transection of the ITB would significantly increase thigh adduction range of motion as measured by an inclinometer when performing either Ober test and that subsequent structure transections (gluteus med/min muscles followed by the hip joint capsule) would cause additional increases in thigh adduction.

STUDY DESIGN: Controlled laboratory study.

METHODS: The lower limbs of lightly embalmed cadavers were assessed for midhigh ITB transection versus intact by use of the Ober (n = 28) and modified Ober (n = 34) tests; 18 lower limbs were assessed for all conditions (intact band, followed by sequential transections of the ITB midhigh, gluteus med/min muscles, hip joint capsule) by use of both Ober tests. Paired t tests were used to compare changes in Ober test results between conditions.

RESULTS: No significant changes in thigh position (adduction) occurred in either version of the Ober test after ITB transection. Significant differences were noted for intact band versus gluteus med/min transection and intact band versus hip joint capsule transection (P < .0001) for all findings for both tests. Mean inclinometer measurements for the modified Ober were 4.28° (n = 34 for intact vs ITB transection comparisons), 3.33° (n = 18 for subsequent intact vs gluteus muscle and hip capsule transection comparisons), 5.00° (n = 34 for midhigh ITB transection), 11.20° (gluteus med/min transection), and 13.20° (hip capsule transection). For the Ober test, measures were -2.90° (n = 28 for intact vs ITB transection comparisons), -2.20° (n = 18 for subsequent intact vs gluteus muscle and hip capsule transection comparisons), -2.20° (n = 34 for midhigh ITB transection), 6.50° (gluteus med/min transection), and 9.53° (hip capsule transection). Statistically significant differences were also noted between test findings comparing gluteus med/min transection to hip capsule transection (Ober, P < .0001; modified Ober, P = .0036).

CONCLUSION: The study findings refute the hypothesis that the ITB plays a role in limiting hip adduction during either version of the Ober test and question the validity of these tests for determining ITB tightness. The findings underscore the influence of the gluteus medius and minimus muscles as well as the hip joint capsule on Ober test findings.

CLINICAL RELEVANCE: The results of this study suggest that the Ober test assesses tightness of structures proximal to the hip joint, such as the gluteus medius and minimus muscles and the hip joint capsule, rather than the ITB.

KEYWORDS: Ober test; iliotibial band; knee pain; lightly embalmed cadaver; modified Ober test
PMID: 26755689

Gluteus med and min weakness and risk of falls

J Comput Assist Tomogr. 2016 Mar-Apr;40(2):238-242.

Association of Gluteus Medius and Minimus Muscle Atrophy and Fall-Related Hip Fracture in Older Individuals Using Computed Tomography.

Chi AS¹, Long SS, Zoga AC, Parker L, Morrison WB.

Author information

Abstract

PURPOSE:

The aim of this study was to determine an association between fall-related hip and/or pelvic fractures and gluteus medius and minimus atrophy.

METHODS:

Retrospective review of 64 patients with fall-related hip/pelvic fractures and 96 age- and sex-stratified controls was performed. Gluteus medius, gluteus minimus, tensor fascia lata, and iliopsoas atrophy was scored using a standard scale. Statistical analysis was performed.

RESULTS:

There is a significant difference ($P < 0.0001$) in gluteus medius and minimus atrophy in the fracture versus control groups. Presence of gluteus atrophy was predictive of fall-related fracture (odds ratio, 2.15; 95% confidence interval, 1.08-4.31). There is no significant difference in tensor fascia lata ($P = 0.47$) or iliopsoas ($P = 0.15$) atrophy between the 2 groups. Gluteus atrophy increased with age ($r = 0.41$, $P < 0.0001$). In unilateral fractures, there is a significant difference ($P = 0.0002$) in ipsilateral versus contralateral gluteus medius atrophy.

CONCLUSIONS:

Gluteus medius and minimus muscle atrophy is greater in fall-related hip/pelvic fractures, which may predispose the elderly to falls.

PMID: 26571058

28. REPLACEMENTS

Opioid use and higher level of surgical failures

BMC Musculoskelet Disord. 2016 Mar 10;17(1):122. doi: 10.1186/s12891-016-0970-6.

Opioid use after total hip arthroplasty surgery is associated with revision surgery.

Inacio MC¹, Pratt NL^{2,3}, Roughead EE^{2,3}, Paxton EW⁴, Graves SE⁵.

Author information

Abstract

BACKGROUND:

Pain is an indication for total hip arthroplasty (THA) and it should be resolved post-surgery. Because patients' pain is typically treated pharmacologically we tested whether opioid use can be used as a surrogate for patient-reported pain and as an indicator for early surgical failure. Specifically, we evaluated whether the amount of opioids taken within the year after THA was associated with one and five years risk of revision surgery.

METHODS:

A cohort of 9943 THAs (01/2001-12/2012) was evaluated. Post-operative opioid use was the exposure of interest and cumulative daily oral morphine equivalent (OME) amounts were calculated. Total OMEs/90-day periods were categorised into quartiles. Revisions within one and five years were the outcomes of interest.

RESULTS:

Of the THAs, 2.0 % (N = 200) were revised within one year and 4.2 % (N = 413) within five years. After adjustments for gender, age, surgical indication, co-morbidities, and other analgesics, revision was associated with amount of OMEs in the second quarter after THA (days 91-180 after discharge). Patients on medium-high amounts of OME (400-1119 mg) had higher risk of one (hazard ratio (HR) = 2.22, 95 % CI 1.08-4.56) and five year (HR = 1.66, 95 % CI 1.08-2.56) revision than a patient not taking opioids. During the same period, patients taking the highest amounts of OMEs (≥ 1120 mg) had a 2.64 (95 % CI 1.03-6.74) times higher risk of one year and a 2.11 (95 % CI 1.13-3.96) times higher risk of five year revision.

CONCLUSIONS:

Opioid use 91-180 days post-surgery is associated with higher risk of revision surgery and therefore is an early and useful indicator for surgical failure.

KEYWORDS: Analgesic drugs; Opioids; Revision; Total hip arthroplasty
PMID: 26965992

29. OA

Changes in muscle function

Knee. 2016 Feb 24. pii: S0968-0160(16)00043-0. doi: 10.1016/j.knee.2016.02.002.

Biomechanical and neuromuscular adaptations during the landing phase of a stepping-down task in patients with early or established knee osteoarthritis.

Sanchez-Ramirez DC¹, Malfait B², Baert I³, van der Leeden M⁴, van Dieën J⁵, Lems WF⁶, Dekker J⁷, Luyten FP⁸, Verschueren S⁹.

Author information

Abstract

BACKGROUND:

To compare the knee joint kinematics, kinetics and EMG activity patterns during a stepping-down task in patients with knee osteoarthritis (OA) with control subjects.

METHODS:

33 women with knee OA (early OA, n=14; established OA n=19) and 14 female control subjects performed a stepping-down task from a 20cm step. Knee joint kinematics, kinetics and EMG activity were recorded on the stepping-down leg during the loading phase.

RESULTS:

During the stepping-down task patients with established knee OA showed greater normalized medial hamstrings activity ($p=0.034$) and greater vastus lateralis-medial hamstrings co-contraction ($p=0.012$) than controls. Greater vastus medialis-medial hamstrings co-contraction was found in patients with established OA compared to control subjects ($p=0.040$) and to patients with early OA ($p=0.023$). Self-reported knee instability was reported in 7% and 32% of the patients with early and established OA, respectively.

CONCLUSIONS:

The greater EMG co-activity found in established OA might suggest a less efficient use of knee muscles or an attempt to compensate for greater knee laxity usually present in patients with established OA. In the early stage of the disease, the biomechanical and neuromuscular control of stepping-down is not altered compared to healthy controls.

KEYWORDS: Biomechanics; Knee instability; Muscle strength; Osteoarthritis; Stepping-down
PMID: 26922798

30 A. IMPINGEMENT

New view

at Rev Rheumatol. 2016 Mar 10. doi: 10.1038/nrrheum.2016.17.

New perspectives on femoroacetabular impingement syndrome.

Khan M¹, Bedi A², Fu F³, Karlsson J⁴, Ayeni OR¹, Bhandari M¹.

Author information

Abstract

Femoroacetabular impingement (FAI) is characterized by an abnormality in the shape of the femoral head-neck or acetabulum that results in impingement between these two structures. Arthroscopic treatment has become the preferred method of management of FAI owing to its minimally invasive approach. Surgical correction involves resection of impinging osseous structures as well as concurrent management of the associated chondral and labral pathology. Research from the past 5 years has shown that repair of the labrum results in a better anatomic correction and improved outcomes compared with labral debridement. Research is underway to improve cartilage assessment by using innovative imaging techniques and biochemical tests to inform predictions of prognosis.

Several ongoing randomized controlled trials, including the Femoroacetabular Impingement Trial (FAIT) and the Femoroacetabular Impingement Randomized Controlled Trial (FIRST), will provide critical information regarding the diagnosis, management and prognosis of patients undergoing arthroscopic management of FAI.

PMID:26963727

32 A. KNEE/ACL**Pre surgical PT helps**

Clin Rehabil. 2016 Feb 15. pii: 0269215516628617.

The effectiveness of pre-operative exercise physiotherapy rehabilitation on the outcomes of treatment following anterior cruciate ligament injury: A systematic review.

Alshewaier S¹, Yeowell G², Fatoye F³.

Author information

Abstract

OBJECTIVE:

To evaluate the effectiveness of pre-operative exercise physiotherapy rehabilitation on the outcomes of treatment following anterior cruciate ligament injury.

METHODS:

The following databases were searched: PubMed, Ovid, The Cochrane Library and Web of Science. Studies published between the inception of the databases and December 2015 were sought using appropriate keywords in various combinations. This search was supplemented with a manual search of the references of selected studies. Studies were assessed for methodological quality using the Physiotherapy Evidence Database scale.

RESULTS:

A total of 500 studies were identified, of which eight studies met the inclusion criteria and were included in the present review. The average Physiotherapy Evidence Database score for the studies included was 5.8, which reflects an overall moderate methodological quality. The eight studies investigated a total of 451 subjects of which 71% (n=319) were males. The age of the participants in the eight studies ranged from 15 to 57 years. The duration of the intervention in the studies ranged from 3 to 24 weeks. This review found that pre-operative physiotherapy rehabilitation is effective for improving the outcomes of treatment following anterior cruciate ligament injury, including increasing knee-related function and improving muscle strength. However, whilst there was a significant improvement in quality of life from baseline following intervention, no significant difference in quality of life was found between the control and intervention groups.

CONCLUSIONS: There is evidence to suggest that pre-operative physiotherapy rehabilitation is beneficial to patients with anterior cruciate ligament injury.

KEYWORDS: Physical therapy; anterior cruciate ligament injury; outcome assessment (health care); pre-operative exercise; quality of life

PMID: 26879746

33. MENISCUS

Limited MRI value

Knee. 2016 Feb 22. pii: S0968-0160(16)00038-7. doi: 10.1016/j.knee.2016.01.018.

Accuracy of MRI evaluation of meniscus tears in the setting of ACL injuries.

Dufka FL¹, Lansdown DA², Zhang AL², Allen CR², Ma CB², Feeley BT².

Author information

Abstract

BACKGROUND:

Our purpose was to evaluate the diagnostic performance of magnetic resonance imaging (MRI) for the pre-operative detection of meniscus tears requiring operative intervention, and identify factors that determined accuracy of diagnosing meniscus tears, in the setting of anterior cruciate ligament (ACL) reconstruction.

METHODS:

Patients who underwent primary ACL reconstruction were retrospectively reviewed. A meniscus tear was classified as requiring treatment if it was debrided or repaired at the time of ACL reconstruction. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of pre-operative MRIs were determined for medial and lateral meniscus tears.

RESULTS:

Sensitivity, specificity, PPV, and NPV of MRI were 0.90, 0.75, 0.58, and 0.95 for medial meniscus tears, respectively, and 0.67, 0.81, 0.65, and 0.82 for lateral meniscus tears. MRI-diagnosed medial meniscus tears were associated with a longer time interval between initial injury and imaging compared to ACL tears without concomitant meniscus injury on MRI ($p=0.038$). Vertical medial meniscus tears were less likely than other tear patterns to require treatment at the time of ACL reconstruction ($p=0.03$). MRI showed a higher diagnostic performance for lateral meniscus tears when surgery was performed within 30days of imaging.

CONCLUSIONS:

This study demonstrates only moderate sensitivity and specificity of pre-operative MRI in the detection of meniscus tears requiring operative treatment in the setting of ACL injury. High rates of false diagnoses were observed, suggesting MRI may not be as accurate in predicting positive or negative meniscus findings at the time of ACL reconstruction as previously reported.

LEVEL OF EVIDENCE: Level III.

KEYWORDS: ACL injury; Accuracy; Magnetic resonance imaging; Meniscus tear; NPV; PPV
PMID:26917035

34. PATELLA

Mulligan taping

Am J Sports Med. 2016 Feb 22. pii: 0363546516629418.

The Effect of the Mulligan Knee Taping Technique on Patellofemoral Pain and Lower Limb Biomechanics.

Hickey A¹, Hopper D¹, Hall T¹, Wild CY².

Author information

Abstract

BACKGROUND:

Patellofemoral pain (PFP) affects 25% of the general population, occurring 2 times more often in females compared with males. Taping is a valuable component of the management plan for altering lower limb biomechanics and providing pain relief; however, the effects of alternative taping techniques, such as Mulligan knee taping, appear yet to be researched.

PURPOSE:

To determine whether the Mulligan knee taping technique altered levels of perceived knee pain and lower limb biomechanics during a single-legged squat (SLSq) in adult females with PFP.

STUDY DESIGN:

Controlled laboratory study.

METHODS:

A total of 20 female patients with PFP, aged 18 to 35 years, participated in this study. Participants performed 3 to 5 SLSq on their most symptomatic limb during a taped (Mulligan knee taping technique) and nontaped (control) condition. During the eccentric phase of the SLSq, the 3-dimensional kinematics (250 Hz) of the knee and hip and the ground-reaction forces (1000 Hz) and muscle activation patterns (1000 Hz) of the gluteus medius, vastus lateralis, and vastus medialis oblique were measured. Participants' perceived maximum knee pain was also recorded after the completion of each squat.

RESULTS:

Between-condition differences were found for hip kinematics and gluteus medius activation but not for kinetics or vastus medialis oblique and vastus lateralis muscle activity (timing and activation). Compared with the nontaped condition, the Mulligan knee taping technique significantly ($P = .001$) reduced perceived pain during the SLSq (mean \pm SD: 2.29 ± 1.79 and 1.29 ± 1.28 , respectively). In the taped condition compared with the control, the onset timing of the gluteus medius occurred significantly earlier (120.6 ± 113.0 and 156.6 ± 91.6 ms, respectively; $P = .023$) and peak hip internal rotation was significantly reduced ($6.38^\circ \pm 7.31^\circ$ and $8.34^\circ \pm 7.92^\circ$, respectively; $P = .002$).

CONCLUSION:

The Mulligan knee taping technique successfully reduced knee pain in participants with PFP. This is the first study to establish a link between Mulligan knee taping and the reduction of PFP in conjunction with decreased hip internal rotation and earlier activation of gluteus medius.

CLINICAL RELEVANCE:

The Mulligan knee taping technique may benefit the clinical environment by providing an alternative evidence-based treatment plan for PFP.

Patella tracking

Knee. 2016 Feb 24. pii: S0968-0160(16)00041-7. doi: 10.1016/j.knee.2016.01.021.

Dynamic tracking influenced by anatomy in patellar instability.

Elias JJ¹, Soehnlén NT², Guseila LM³, Cosgarea AJ⁴.

Author information

Abstract

BACKGROUND:

The current study was performed to correlate anatomical parameters related to trochlear dysplasia, tibial tuberosity position, and patella alta with in vivo patellar tracking for subjects with recurrent patellar instability.

METHODS:

Eight subjects with recurrent patellar instability that failed conservative treatment were evaluated using computational reconstruction of in vivo knee motion. Computational models were created from dynamic CT scans of the knee during extension against gravity. Shape matching techniques were utilized to position a single model of each bone (femur, patella and tibia) to represent multiple positions of knee extension. Patellar tracking was characterized by the bisect offset index (lateral shift) and lateral tilt. Anatomical parameters were characterized by the inclination of the lateral ridge of the trochlear groove, the lateral distance from the tibial tuberosity to the posterior cruciate ligament attachment (lateral TT-PCL distance), and the Caton-Deschamps index. Stepwise multivariable linear regression analysis was used to relate patellar tracking to the anatomical parameters at low (<20°) and high flexion angles.

RESULTS:

At low flexion angles, both lateral trochlear inclination and lateral TT-PCL distance were significantly correlated with bisect offset index (p=0.02). Only lateral trochlear inclination was significantly correlated with lateral tilt (p<0.001). At high flexion angles, bisect offset index and lateral tilt were correlated with only lateral TT-PCL distance (p≤0.02).

CONCLUSION:

Parameters related to trochlear dysplasia and tibial tuberosity position were both related to patellar tracking, but the relationship changed with the flexion angle.

CLINICAL RELEVANCE:

The anatomical parameters related to patellar tracking can be used to evaluate the risk of continued instability and guide surgical treatment.

KEYWORDS: Patellar instability; Patellar tracking; Tibial tuberosity; Trochlear dysplasia
PMID: 26922799

37. OSTEOARTHRITIS/KNEE**MT and bolster**

Osteoarthritis Cartilage. 2016 Mar 10. pii: S1063-4584(16)01058-X. doi: 10.1016/j.joca.2016.03.001.

Exercise, Manual Therapy, and Use of Booster Sessions in Physical Therapy for Knee Osteoarthritis: A Multi-Center, Factorial Randomized Clinical Trial.

Fitzgerald GK¹, Fritz JM², Childs JD³, Brennan GP⁴, Talisa V⁵, Gil A⁶, Neilson BD⁷, Abbott JH⁸.
Author information

Abstract

OBJECTIVE:

1) Do treatment effects differ between participants receiving manual therapy (MT) with exercise compared to subjects who don't, 2) are treatment effects sustained better when participants receive booster sessions compared to those who don't over a one year period in subjects with knee osteoarthritis (OA)?

DESIGN:

Multi-center, 2x2 factorial randomized clinical trial. 300 participants with knee OA were randomized to 4 groups: exercise-no boosters (Ex), exercise-with boosters(Ex+B), manual therapy+exercise-no boosters(MT+Ex), manual therapy+exercise-with boosters(MT+Ex+B). The primary outcome was the Western Ontario and McMaster osteoarthritis index (WOMAC) at 1 year. Secondary outcomes included knee pain, physical performance tests, and proportions of participants meeting treatment responder criteria.

RESULTS:

There were no differences between groups on the WOMAC at 1 year or on any performance-based measures. Secondary analyses indicated a) better scores on the WOMAC and greater odds of being a treatment responder at 9 weeks for participants receiving MT, b) greater odds of being a treatment responder at 1 year for participants receiving boosters. Exploratory interaction analysis suggested knee pain decreases for participants receiving boosters and increases for participants not receiving boosters from 9 weeks to 1 year.

CONCLUSIONS:

MT or use of boosters with exercise did not result in additive improvement in the primary outcome at 1 year. Secondary outcomes suggest MT may have some short term benefit, and booster sessions may improve responder status and knee pain at 1 year. However, the role of booster sessions remains unclear in sustaining treatment effects and warrants further study. ClinicalTrials.gov (NCT01314183).

KEYWORDS: Booster Sessions; Exercise; Knee; Manual Therapy; Osteoarthritis; Physical Therapy
PMID:26973326

Central sensitization

[Phys Ther.](#) 2016 Mar 3.

Expanded Distribution of Pain as a Sign of Central Sensitization in Individuals With Symptomatic Knee Osteoarthritis.

[Lluch Girbés E](#)¹, [Dueñas L](#)², [Barbero M](#)³, [Falla D](#)⁴, [Baert IA](#)⁵, [Meeus M](#)⁶, [Sánchez-Frutos J](#)⁷, [Aguilella L](#)⁸, [Nijs J](#)⁹.

[Author information](#)

Abstract

BACKGROUND:

Expanded distribution of pain is considered a sign of central sensitization (CS). The relationship between recording of symptoms and CS in people with knee osteoarthritis (OA) has been poorly investigated.

OBJECTIVE:

To examine whether the area of pain assessed using pain drawings relates to CS and clinical symptoms in people with knee OA.

DESIGN:

Cross-sectional study.

METHODS:

Fifty-three subjects with knee OA scheduled to undergo primary total knee arthroplasty were studied. All participants completed pain drawings using a novel digital device, self-administration questionnaires and were assessed by quantitative sensory testing. Pain frequency maps were generated separately for women and men. Spearman's correlation coefficients were computed to reveal possible correlations between the area of pain and quantitative sensory testing and clinical symptoms.

RESULTS:

Pain frequency maps revealed enlarged areas of pain, especially in women. Enlarged areas of pain were associated with higher knee pain severity ($r_s = .325$, $P < 0.05$) and stiffness ($r_s = .341$, $P < 0.05$), lower pressure pain thresholds at the knee ($r_s = -.306$, $P < 0.05$) and epicondyle ($r_s = -.308$, $P < 0.05$) and higher scores with the Central Sensitization Inventory ($r_s = .456$, $P < 0.01$). No significant associations were observed between the area of pain and the remaining clinical symptoms and measures of CS.

LIMITATIONS:

Firm conclusions about the predictive role of pain drawings cannot be drawn. Further evaluation of the reliability and validity of pain area extracted from pain drawings in people with knee OA is required.

CONCLUSION:

Expanded distribution of pain was correlated with some measures of CS in individuals with knee OA. Pain drawings may constitute an easy way for the early identification of CS in people with knee OA, but further research is required.

PMID: 26939604

44. RHUMATOID ARTHRITIS

Stem cells help

Synovial mesenchymal stem cells from osteo- or rheumatoid arthritis joints exhibit good potential for cartilage repair using a scaffold-free tissue engineering approach

Osteoarthritis and Cartilage , 03/14/2016 Koizumi K, et al.

The study aims to assess whether synovial mesenchymal stem cells (SMSCs) from patients with osteoarthritis (OA) or rheumatoid arthritis (RA) can be used as an alternative cell source for cartilage repair using allogenic tissue engineered construct (TEC). SMSCs from OA or RA patients are no less appropriate for repairing cartilage than those from trauma patients and thus, may be an effective source for allogenic cell-based cartilage repair.

45 A. MANUAL THERAPY LUMBAR & GENERAL**Osteopathic principles**

Chiropr Man Therap. 2016 Mar 8;24:6. doi: 10.1186/s12998-016-0087-x. eCollection 2016.

Understanding clinical reasoning in osteopathy: a qualitative research approach.

Grace S¹, Orrock P¹, Vaughan B², Blaich R¹, Coutts R¹.

Author information

Abstract

BACKGROUND:

Clinical reasoning has been described as a process that draws heavily on the knowledge, skills and attributes that are particular to each health profession. However, the clinical reasoning processes of practitioners of different disciplines demonstrate many similarities, including hypothesis generation and reflective practice. The aim of this study was to understand clinical reasoning in osteopathy from the perspective of osteopathic clinical educators and the extent to which it was similar or different from clinical reasoning in other health professions.

METHODS:

This study was informed by constructivist grounded theory. Participants were clinical educators in osteopathic teaching institutions in Australia, New Zealand and the UK. Focus groups and written critical reflections provided a rich data set. Data were analysed using constant comparison to develop inductive categories.

RESULTS:

According to participants, clinical reasoning in osteopathy is different from clinical reasoning in other health professions. Osteopaths use a two-phase approach: an initial biomedical screen for serious pathology, followed by use of osteopathic reasoning models that are based on the relationship between structure and function in the human body. Clinical reasoning in osteopathy was also described as occurring in a number of contexts (e.g. patient, practitioner and community) and drawing on a range of metaskills (e.g. hypothesis generation and reflexivity) that have been described in other health professions.

CONCLUSIONS:

The use of diagnostic reasoning models that are based on the relationship between structure and function in the human body differentiated clinical reasoning in osteopathy. These models were not used to name a medical condition but rather to guide the selection of treatment approaches. If confirmed by further research that clinical reasoning in osteopathy is distinct from clinical reasoning in other health professions, then osteopaths may have a unique perspective to bring to multidisciplinary decision-making and potentially enhance the quality of patient care. Where commonalities exist in the clinical reasoning processes of osteopathy and other health professions, shared learning opportunities may be available, including the exchange of scaffolded clinical reasoning exercises and assessment practices among health disciplines.

PMID: 26958339

Prescriptive vs. therapist selected mob.

Orthop Sports Phys Ther. 2016 Mar 8:1-29.

A Prescriptively Selected Non-Thrust Manipulation Versus a Therapist Selected Non-Thrust Manipulation for Treatment of Individuals With Low Back Pain: A Randomized Clinical Trial.

Donaldson M¹, Petersen S², Cook C³, Learman K⁴.

Author information

Abstract

Study Design Randomized controlled trial.

Background Several studies that have investigated the effects of a therapist selected versus a randomized assigned segmental approach have looked at immediate effects only for pain-related outcomes.

Objectives To examine differences in outcomes following a therapist selected non-thrust manipulation versus a prescriptively selected non-thrust manipulation in subjects with low back pain (LBP).

Methods Subjects with mechanically producible LBP were randomly treated with non-thrust manipulation in a therapist selected approach or a prescriptively selected approach. All subjects received a standardized home exercise program. Outcomes measures included pain, disability, Global Rating of Change (GRoC) and Patient Acceptable Symptoms State (PASS). ANCOVAs a Chi square and a Mann Whitney U were used to determine differences between groups.

Results 63 subjects were tracked for 6 months; subjects in both groups significantly improved. There were no differences between groups in pain, disability, or PASS scores at 6 months. There was a significant difference in GRoC scores favoring the therapist selected manipulation group at 6 months.

Conclusion This study measured long-term differences between a prescriptively selected non-thrust manipulation and a therapist selected approach to non-thrust manipulation. In pain, disability and PASS there were no differences in outcomes, a finding that is similar in immediate effects studies. After 6 months perceived well-being was significantly higher for those in the therapist selected treatment group. Level of Evidence Therapy, level 1b. *J Orthop Sports Phys Ther*, Epub 8 Mar 2016. doi:10.2519/jospt.2016.6318.

KEYWORDS: joint mobilization; low back pain; manual therapy; outcomes PMID: 26954273

MDT and directional preference

J Orthop Sports Phys Ther. 2016 Jan 26:1-29.

The Influence of Centralization and Directional Preference on Spinal Control in Patients With Nonspecific Low Back Pain.

Apeldoorn AT¹, van Helvoirt H², Meihuizen H², Tempelman H³, Vandeput D⁴, Knol DL⁵, Kamper SJ⁶, Ostelo RW⁷.

Author information

Abstract

Study Design Prospective cohort, test-retest design.

Background DP/CEN and DP/non-CEN are common pain pattern responses assessed by Mechanical Diagnosis & Therapy (MDT). Although there is evidence that MDT can reduce pain and disability in the short term by treating the patient with direction-specific exercises concordant with the patient's DP, the mechanism responsible for this is unclear.

Objective To determine if clinical signs of impaired spinal control improve immediately after eliciting a directional preference with centralization response (DP/CEN), or a directional preference without centralization response (DP/non-CEN), in patients with nonspecific low back pain (LBP).

Methods Participants underwent a standardized MDT assessment and were classified in a pain pattern subgroup; DP/CEN, DP/non-CEN, or no-DP. Clinical signs of impaired spinal control were assessed pre- and post-MDT assessment by an independent examiner. Four spinal control tests were conducted: aberrant lumbar movements while bending forward, the active straight leg raise (ASLR) test, the Trendelenburg test and the prone instability test. Differences in spinal control pre- and post-MDT assessment were calculated for the three pain pattern subgroups and compared with Chi-square tests. We hypothesized that a larger proportion of patients in the DP/CEN subgroup would improve on spinal control than patients categorized as DP/non-CEN or no-DP.

Results Of 114 patients recruited, 51 patients (44.7%) were categorized as DP/CEN, 23 (20.2%) as DP/non-CEN, and 40 (35.1%) as no-DP. Before MDT assessment between 28.9% (Trendelenburg test) and 63.7% (ASLR test) of patients showed impaired spinal control. After MDT assessment a larger proportion of patients in the DP/CEN subgroup (43%) showed improvement than those in the no-DP subgroup (7%) on aberrant lumbar movements ($P = .02$). Likewise, more patients in the DP/CEN subgroup (50%) improved on the ASLR test than in the no-DP subgroup (8%, $P < .01$) or the DP/non-CEN subgroup (7%, $P = .01$). Changes in Trendelenburg and prone instability tests did not reach statistical significance.

Conclusions Immediately following MDT assessment, a larger proportion of patients with a DP/CEN pain pattern showed improvement in clinical signs of spinal control compared to patients with a DP/non-CEN or no-DP pain pattern. Level of Evidence 2b. *J Orthop Sports Phys Ther*, Epub 26 Jan 2016. doi:10.2519/jospt.2016.6158.

KEYWORDS: Mechanical Diagnosis and Therapy; motor control; physical therapy

PMID: 26813757

Intervertebral motions

BMC Musculoskelet Disord. 2016 Mar 10;17(1):121. doi: 10.1186/s12891-016-0975-1.

Relationships between lumbar inter-vertebral motion and lordosis in healthy adult males: a cross sectional cohort study.

du Rose A^{1,2}, Breen A^{3,4}.

Author information

Abstract

BACKGROUND:

Intervertebral motion impairment is widely thought to be related to chronic back disability, however, the movements of inter-vertebral pairs are not independent of each other and motion may also be related to morphology. Furthermore, maximum intervertebral range of motion (IV-RoMmax) is difficult to measure accurately in living subjects. The purpose of this study was to explore possible relationships between (IV-RoMmax) and lordosis, initial attainment rate and IV-RoMmax at other levels during weight-bearing flexion using quantitative fluoroscopy (QF).

METHODS:

Continuous QF motion sequences were recorded during controlled active sagittal flexion of 60° in 18 males (mean age 27.6 SD 4.4) with no history of low back pain in the previous year. IV-RoMmax, lordotic angle, and initial attainment rate at all inter-vertebral levels from L2-S1 were extracted. Relationships between IV-RoMmax and the other variables were explored using correlation coefficients, and simple linear regression was used to determine the effects of any significant relationships. Within and between observer repeatability of IV-RoMmax and initial attainment rate measurements were assessed in a sub-set of ten participants, using the intra-class correlation coefficient (ICC) and standard error of measurement (SEM).

RESULTS:

QF measurements were highly repeatable, the lowest ICC for IV-RoMmax, being 0.94 (0.80-0.99) and highest SEM (0.76°). For initial attainment rate the lowest ICC was 0.84 (0.49-0.96) and the highest SEM (0.036). The results also demonstrated significant positive and negative correlations between IV-RoMmax and IV-RoMmax at other lumbar levels ($r = -0.64-0.65$), lordosis ($r = -0.52-0.54$), and initial attainment rate ($r = -0.64-0.73$). Simple linear regression analysis of all significant relationships showed that these predict between 28 and 42 % of the variance in IV-RoMmax.

CONCLUSIONS:

This study found weak to moderate effects of individual kinematic variables and lumbar lordosis on IV-RoMmax at other intervertebral levels. These effects, when combined, may be important when such levels are being considered by healthcare professionals as potential sources of pain generation. Multivariate investigations in larger samples are warranted.

KEYWORDS: *Agreement; Fluoroscopy; Lordosis; Reliability; Spine kinematics*

45 B. MANUAL THERAPY CERVICAL

Cervical lordosis and manipulation

Chiropr Man Therap. 2015 Dec 7;23:33. doi: 10.1186/s12998-015-0078-3. eCollection 2015.

Does cervical lordosis change after spinal manipulation for non-specific neck pain? A prospective cohort study.

Shilton M¹, Branney J², de Vries BP¹, Breen AC³.

Author information

Abstract

BACKGROUND:

The association between cervical lordosis (sagittal alignment) and neck pain is controversial. Further, it is unclear whether spinal manipulative therapy can change cervical lordosis. This study aimed to determine whether cervical lordosis changes after a course of spinal manipulation for non-specific neck pain.

METHODS:

Posterior tangents of C2 and C6 were drawn on the lateral cervical fluoroscopic images of 29 patients with subacute/chronic non-specific neck pain and 30 healthy volunteers matched for age and gender, recruited August 2011 to April 2013. The resultant angle was measured using 'Image J' digital geometric software. The intra-observer repeatability (measurement error and reliability) and intra-subject repeatability (minimum detectable change (MDC) over 4 weeks) were determined in healthy volunteers. A comparison of cervical lordosis was made between patients and healthy volunteers at baseline. Change in lordosis between baseline and 4-week follow-up was determined in patients receiving spinal manipulation.

RESULTS:

Intra-observer measurement error for cervical lordosis was acceptable (SEM 3.6°) and reliability was substantial ICC 0.98, 95 % CI 0.962-0.991). The intra-subject MDC however, was large (13.5°). There was no significant difference between lordotic angles in patients and healthy volunteers ($p = 0.16$). The mean cervical lordotic increase over 4 weeks in patients was 2.1° (9.2) which was not significant ($p = 0.12$).

CONCLUSIONS:

This study found no difference in cervical lordosis (sagittal alignment) between patients with mild non-specific neck pain and matched healthy volunteers. Furthermore, there was no significant change in cervical lordosis in patients after 4 weeks of cervical spinal manipulation.

KEYWORDS: Cervical lordosis; Neck pain; Sagittal alignment; Spinal manipulation
PMID:26644909

Headache manual therapy

Eur J Phys Rehabil Med. 2016 Feb 29.

Do manual therapy techniques have a positive effect on quality of life in people with tension-type headache? A randomized controlled trial.

Espi-Lopez GV¹, RODRÍGUEZ-Blanco C, Oliva-Pascual-Vaca Á, Molina-Martinez FJ, Falla D.
Author information

Abstract

BACKGROUND:

Controversy exists regarding the effectiveness of manual therapy for the relief of tension-type headache (TTH). However most studies have addressed the impact of therapy on the frequency and intensity of pain. No studies have evaluated the potentially significant effect on the patient's quality of life.

AIM:

To assess the quality of life of patients suffering from TTH treated for 4 weeks with different manual therapy techniques.

DESIGN:

Factorial, randomized, single-blinded, controlled clinical trial.

SETTING:

Specialized center for the treatment of headache.

POPULATION:

Seventy-six (62 women) patients aged between 18 and 65 years (age: 39.9 ± 10.9) with either episodic or chronic TTH.

METHODS:

Patients were divided into four groups: suboccipital inhibitory pressure; suboccipital spinal manipulation; a combination of the two treatments; control. Quality of life was assessed using the SF-12 questionnaire (considering both the overall score and the different dimensions) at the beginning and end of treatment, and after a one month follow-up.

RESULTS:

Compared to baseline, the suboccipital inhibition treatment group showed a significant improvement in their overall quality of life at the one month follow-up and also showed specific improvement in the dimensions related to moderate physical activities, and in their emotional role. All the treatment groups, but not the control group, showed improvements in their physical role, bodily pain, and social functioning at the one month follow-up. Post treatment and at the one month follow-up, the combined treatment group showed improved vitality and the two treatment groups that involved manipulation showed improved mental health.

CONCLUSIONS:

All three treatments were effective at changing different dimensions of quality of life, but the combined treatment showed the most change. The results support the effectiveness of treatments applied to the suboccipital region for patients with TTH.

CLINICAL REHABILITATION IMPACT:

Manual therapy techniques applied to the suboccipital region, for as little as four weeks, offered a positive improvement in some aspects of quality of life of patient's suffering with TTH.

45 C. MANUAL THERAPY THORACIC

Impact on deep cervical flexors

J Phys Ther Sci. 2016 Jan;28(1):175-80. doi: 10.1589/jpts.28.175. Epub 2016 Jan 30.

Effect of thoracic manipulation and deep craniocervical flexor training on pain, mobility, strength, and disability of the neck of patients with chronic nonspecific neck pain: a randomized clinical trial.

Lee KW¹, Kim WH².

Abstract

[Purpose] To investigate the effects of thoracic manipulation and deep craniocervical flexor training on the muscle strength and endurance, range of motion, and the disability index of the neck of patients with chronic nonspecific neck pain.

[Subjects and Methods] Forty-six patients with chronic neck pain participated. They received an intervention for 35 minutes a day, three times a week for 10 weeks. Subjects were randomly assigned to one control and two experimental groups: group A (thoracic manipulation combined with deep craniocervical flexor training, n=16), group B (deep craniocervical flexor training, n=15), and group C (active self-exercise as a control group, n=15). Muscle strength and endurance, pain, neck disability index, and range of motion of the cervical and thoracic spine were measured before and after the intervention.

[Results] Group A showed significant increases in muscle strength, endurance, and cervical and thoracic range of motion, and significant decreases in the pain and neck disability index, compared with groups B and C.

[Conclusion] Although deep craniocervical flexor training is effective at improving neck function, thoracic manipulation combined with deep craniocervical flexor training was a more effective intervention for pain relief and improving the range of motion, muscle function, and neck disability of patients with nonspecific chronic neck pain.

45 D. MANUAL THERAPY EXTREMITIES**Knee joint mob**

J Orthop Sports Phys Ther. 2016 Mar;46(3):168-76. doi: 10.2519/jospt.2016.6259. Epub 2016 Jan 1.

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

Courtney CA, Steffen AD, Fernández-de-Las-Pñas C, Kim J, Chmell SJ.

Abstract

Study Design An experimental laboratory study with a repeated-measures crossover design.

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

Methods An examination of 40 individuals with moderate/severe knee osteoarthritis identified 29 (73%) with impaired CPM. The subjects were randomized to receive 6 minutes of knee joint mobilization (intervention) or manual cutaneous input only, 1 week apart. Deep tissue hyperalgesia was examined via pressure pain thresholds bilaterally at the knee medial joint line and the hand at baseline, postintervention, and post-CPM testing. Further, vibration perception threshold was measured at the medial knee epicondyle at baseline and post-CPM testing.

Results Joint mobilization, but not cutaneous input intervention, resulted in a global increase in pressure pain threshold, indicated by diminished hyperalgesic responses to pressure stimulus. Further, CPM was significantly enhanced following joint mobilization. Diminished baseline vibration perception threshold acuity was enhanced following joint mobilization at the knee that received intervention, but not at the contralateral knee. Resting pain was also significantly lower following the joint intervention.

Conclusion Conditioned pain modulation was enhanced following joint mobilization, demonstrated by a global decrease in deep tissue pressure sensitivity. Joint mobilization may act via enhancement of descending pain mechanisms in patients with painful knee osteoarthritis. *J Orthop Sports Phys Ther* 2016;46(3):168-176. Epub 1 Jan 2016. doi:10.2519/jospt.2016.6259.

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

PMID: 26721229

46 B. LOWER LIMB NEUROMOILIZATION

The short term effects of straight leg raise neurodynamic treatment on pressure pain and vibration thresholds in individuals with spinally referred leg pain☆

Dr Colette Ridehalgh, PhD, MSc, MCSP, MMACP (Senior Lecturer) Professor Ann Moore, PhD, FCSP, FMACP, Cert Ed Dr Alan Hough, PhD, MCSP (Honorary Associate Professor)

Highlights

- •A straight leg raise tensioner was given to people with spinally referred leg pain
- •Treatment duration was 3 x 1 minute
- •Pressure pain thresholds and vibration thresholds were the outcome measures
- •No statistical differences were found before and after treatment or between groups
- •Psychosocial factors, disability and central sensitisation didn't alter outcomes

Abstract

Background

Limited research exists for the effects of neurodynamic treatment techniques. Understanding short term physiological outcomes could help to better understand immediate benefits or harm of treatment.

Objectives

To assess the short-term effects of a straight leg raise (SLR) tensioner on pressure pain thresholds (PPT) and vibration thresholds (VT), and establish if additional factors influence outcome in individuals with spinally referred leg pain.

Design

Experimental, repeated measures.

Methods

Sixty seven participants (mean age (SD) 52.9 (13.3), 33 female) with spinally referred leg pain were divided into 3 sub-groups: somatic referred pain, radicular pain and radiculopathy. Individuals were assessed for central sensitisation (CS) and completed 5 disability and psychosocial questionnaires. PPT and VT were measured pre and post a 3 x 1 minute SLR tensioner intervention.

Results

No significant differences ($p > 0.05$) were found between the 3 groups for either outcome measure, or after treatment. Slight improvements in VT were seen in the radiculopathy group after treatment, but were not significant. Only 2 participants were identified with CS. Disability and psychological factors were not significantly different at baseline between the 3 sub-groups, and did not correlate with the outcome measures.

Conclusions

No beneficial effects of treatment were found, but the trend for a decrease in VT indicated that even in individuals with radiculopathy, no detrimental changes to nerve function occurred.

Psychosocial factors and levels of disability did not influence short term outcome of SLR treatment.

48 A. STM

Tensegrity model

Tensegrity and manual therapy practice: A qualitative study

David J. Hohenschurz-Schmidt, M^{Ost} (Hons) HP Dr Jorge E. Esteves, PhD MA BSc (Ost) DO PG Dip Ed FRSM Dr Oliver P. Thomson, PhD MSc BSc (Hons) DO

Abstract

Background

Tensegrity has been proposed as a unifying mechanism between structures at cellular, connective tissue and whole body level. Originating in the fields of sculpture and architecture, tensegrity has recently received increasing attention from practitioners and researchers of manual therapy. Notwithstanding this, evidence regarding the role of the tensegrity principle to manual therapy practice is lacking.

Objective

This qualitative study explored the conception of tensegrity amongst manual therapy practitioners and how knowledge of the physical principle of tensegrity may influence manual therapy practitioners' clinical decision-making.

Methods

Eight semi-structured interviews were conducted with participants from manual therapy, fascia research and/or manual therapy education fields, and analysed using grounded theory methods.

Results

Data from this study indicates that tensegrity may inform clinical decision-making in manual therapy. A theory has been constructed that may help to explain aspects of manual therapy practitioners' approaches to tensegrity. Four such approaches to tensegrity were identified and elaborated on.

Conclusion

This study suggests that apart from being of importance as a scientific model in the fields of architecture, engineering and biology, tensegrity may also be useful to the practice of manual therapy. Here, tensegrity may serve as a theoretical underpinning of previously conceived clinical models and subjective clinical experience, and may also inform decision-making processes by providing a biomechanical model of the human body.

Keywords: *Manual Therapy, Osteopathic manipulative treatment, tensegrity, fascia, clinical reasoning, palpation*

Tissue deformation

Clin Biomech (Bristol, Avon). 2016 Feb 23;33:66-72. doi: 10.1016/j.clinbiomech.2016.02.011.

Differential displacement of soft tissue layers from manual therapy loading.

Engell S¹, Triano JJ², Fox JR³, Langevin HM⁴, Konofagou EE⁵.

Author information

Abstract

BACKGROUND:

Understanding the biomechanics of spinal manipulative therapy requires knowing how loads are transmitted to deeper structures. This investigation monitored displacement at sequential depths in thoracic paraspinal tissues parallel with surface load directions.

METHODS:

Participants were prone and a typical preload maneuver was applied to thoracic tissues. Ultrasound speckle tracking synchronously monitored displacement and shear deformation of tissue layers in a region of interest adjacent to load application to a depth of 4cm. Cumulative and shearing displacements along with myoelectric activity were quantitatively estimated adjacent to loading site.

FINDINGS:

The cephalocaudal cumulative displacement in layers parallel to the surface were, in order of depth, 1.27 (SD=0.03), 1.18 (SD=0.02), and 1.06 (SD=0.01) mm (P<0.000), respectively. The superficial/intermediate shear was 2.1±2.3% whereas the intermediate/deep shear was 4.4% (SE=3.7, P=0.014). Correlation of tissue layers was stronger with application site displacement at the surface (0.87<r<0.89) than with muscle activation (0.65<r<0.67).

INTERPRETATION:

Surface loading of the torso in combined posteroanterior and caudocephalic directions result in both displacement of tissues anteriorly and in shearing between tissue layers in the plane of the tissues strata to depths that could plausibly affect spinal tissues. Displacements of tissues more likely arise passively, consistent with load transmitted by the retinacula cutis and epimuscular force pathways. Displacements are similar in magnitude to those known to evoke biologically relevant responses in both animal and human studies.

KEYWORDS: Biomechanics; Cumulative displacement; Elastography; Electromyography; Shear displacement; Spinal manipulation

Impact of myofascial techniques on ROM

Myofascial techniques: what are their effects on joint range of motion and pain? - A systematic review and meta-analysis of randomised controlled trials

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Summary

Background

This systematic review aimed to determine the evidence for the effect of a single manually applied myofascial technique (MFT) on joint range of motion (JROM) and pain in non-pathological symptomatic subjects.

Methods

Authors independently searched the following databases: PEDro; Cochrane Library; NLM PubMed; EMBASE; Academic Search Premier; MEDLINE; Psychology and Behavioural Sciences Collection; PsycINFO; SPORTSDiscus; CINAHL Plus from 2003 to 2015. All randomised controlled trials (RCTs) that used JROM as an outcome measure were identified. RCT quality was independently evaluated using PEDro and Cochrane Risk of Bias tools and all reported outcome data were independently abstracted and presented. If post-intervention central tendencies and variance were reported, these were assessed for heterogeneity with a view to performing a meta-analysis.

Results

Nine RCTs (n=534) were systematically reviewed and outcome data presented; all trials concluded that MFT increased JROM and reduced pain levels in symptomatic patients. Two RCTs (n=161) were judged 'moderately' heterogeneous ($I^2=47.2\%$; Cochran's $Q=5.69$; $p=0.128$, $df=3$) and meta-analysis using a fixed effects model suggested a 'moderate' effect size of MFTs on jaw opening (ES=0.578; 95%CI 0.302 to 0.853).

Conclusion

Although results reported by each RCT indicate that MFT increases JROM and reduces pain scores, there are a number of threats that challenge the statistical inferences underpinning these findings. Only two trials could be meta-analysed, the results of which suggest that applying MFTs to symptomatic patients diagnosed with latent trigger-points in masseter muscle can increase jaw JROM.

Keywords: Manual therapy, Myofascial technique, Systematic Review, Meta-analysis, Range of motion, Pain

Myofascial for knee pain**The effect of adding myofascial techniques to an exercise programme for patients with anterior knee pain**

Gustavo Telles, PT Delmany R. Cristovão, PT Fabiana Azevedo Terra Cunha Belache, MsC Mariana Rezende Araujo Santos, PT Renato Santos de Almeida, PhD Leandro Alberto Calazans Nogueira, PhD

Summary

Anterior knee pain is a common complaint and can cause difficulty with its inability to bear weight. The aim of the study was to analyse the effect of adding myofascial techniques to an exercise programme for patients with anterior knee pain. A clinical trial with 18 patients with a clinical diagnosis of anterior knee pain was conducted. One group (E) with nine individuals was treated with hip muscle strengthening exercises; another group (EM), with nine individuals, had myofascial techniques added. To quantify the results, the Numeric Pain Rating Scale (NPRS) and the Lower Extremity Functional Scale (LEFS) were used. The E group showed an improvement in pain ($p = 0.02$), but not in the mean degree of disability. The EM group showed an improvement in pain ($p = 0.01$), as well as the degree of disability ($p = 0.008$). The effect size analysis showed that participants of the EM group had a greater impact on clinical pain and disability (Cohen's $d = .35$ and $.30$, respectively). The addition of myofascial techniques should be considered to improve the functionality of the lower limbs and reduce pain in patients with anterior knee pain.

Keywords: Patellofemoral pain syndrome, Anterior knee pain, Physiotherapy and muscle strengthening

49. STRETCHING

SLR increases with PNF and Mulligan

Biol Sport. 2016 Mar;33(1):89-94. doi: 10.5604/20831862.1194126. Epub 2016 Feb 8.

Comparison of effects of static, proprioceptive neuromuscular facilitation and Mulligan stretching on hip flexion range of motion: a randomized controlled trial.

Yıldırım MS¹, Ozyurek S¹, Tosun O¹, Uzer S¹, Gelecek N¹.

Author information

Abstract

The aim of this study was to compare the effects of static stretching, proprioceptive neuromuscular facilitation (PNF) stretching and Mulligan technique on hip flexion range of motion (ROM) in subjects with bilateral hamstring tightness. A total of 40 students (mean age: 21.5 ± 1.3 years, mean body height: 172.8 ± 8.2 cm, mean body mass index: 21.9 ± 3.0 kg · m⁻²) with bilateral hamstring tightness were enrolled in this randomized trial, of whom 26 completed the study. Subjects were divided into 4 groups performing (I) typical static stretching, (II) PNF stretching, (III) Mulligan traction straight leg raise (TSLR) technique, (IV) no intervention. Hip flexion ROM was measured using a digital goniometer with the passive straight leg raise test before and after 4 weeks by two physiotherapists blinded to the groups. 52 extremities of 26 subjects were analyzed. Hip flexion ROM increased in all three intervention groups ($p < 0.05$) but not in the no-intervention group after 4 weeks. A statistically significant change in initial-final assessment differences of hip flexion ROM was found between groups ($p < 0.001$) in favour of PNF stretching and Mulligan TSLR technique in comparison to typical static stretching ($p = 0.016$ and $p = 0.02$, respectively). No significant difference was found between Mulligan TSLR technique and PNF stretching ($p = 0.920$). The initial-final assessment difference of hip flexion ROM was similar in typical static stretching and no intervention ($p = 0.491$). A 4-week stretching intervention is beneficial for increasing hip flexion ROM in bilateral hamstring tightness. However, PNF stretching and Mulligan TSLR technique are superior to typical static stretching. These two interventions can be alternatively used for stretching in hamstring tightness.

KEYWORDS: Biomechanical phenomena; Muscle stretching exercises/methods; Proprioception/physiology; Proprioceptive neuromuscular facilitation; Range of motion; Static stretch; Warm-up
PMID: 26929476

50 B. PNF**Parents distress enhances childrens chronic pain****The longitudinal impact of parent distress and behavior on functional outcomes among youth with chronic pain**

The Journal of Pain, 03/18/2016 Chow ET, et al.

Accumulating evidence supports the concurrent association between parent distress and behavior and child functioning in the context of chronic pain, with existing longitudinal studies limited to a pediatric surgical context that identify parent catastrophizing as influential. Parent distress and behavior was concurrently associated with child distress and functioning at evaluation. After controlling for baseline child functioning, baseline parent avoidance and protective behavior emerged as significant predictors of child functioning at four-month follow-up. Parent distress and behavior influence child distress and functioning over time and these findings identify key parent domains to target in the context of a child's pain treatment.

SLR increases with PNF and Mulligan

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Comparison of effects of static, proprioceptive neuromuscular facilitation and Mulligan stretching on hip flexion range of motion: a randomized controlled trial.

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Abstract

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KEYWORDS: Biomechanical phenomena; Muscle stretching exercises/methods; Proprioception/physiology; Proprioceptive neuromuscular facilitation; Range of motion; Static stretch; Warm-up
PMID: 26929476

51. CFS/BET

Motor plasticity through observation

Eur J Neurosci. 2015 Jun;41(12):1614-23. doi: 10.1111/ejn.12921. Epub 2015 May 23.

Action observation with kinesthetic illusion can produce human motor plasticity.

Nojima I¹, Koganemaru S², Kawamata T³, Fukuyama H², Mima T².

Abstract

After watching sports, people often feel as if their sports skills might have been improved, even without any actual training. On some occasions, this motor skill learning through observation actually occurs. This phenomenon may be due to the fact that both action and action observation (AO) can activate shared cortical areas. However, the neural basis of performance gain through AO has not yet been fully clarified.

In the present study, we used transcranial magnetic stimulation to investigate whether primary motor cortex (M1) plasticity is a physiological substrate of AO-induced performance gain and whether AO itself is sufficient to change motor performance. The excitability of M1, especially that of its intracortical excitatory circuit, was enhanced after and during AO with kinesthetic illusion but not in interventions without this illusion. Moreover, behavioral improvement occurred only after AO with kinesthetic illusion, and a significant correlation existed between the performance gain and the degree of illusion.

Our findings indicated that kinesthetic illusion is an essential component of the motor learning and M1 plasticity induced by AO, and this insight may be useful for the strategic rehabilitation of stroke patients.

KEYWORDS: action observation; motor plasticity; primary motor cortex; transcranial magnetic stimulation PMID: 5892447

Abdominal bracing**Abdominal Bracing Increases Ground Reaction Forces and Reduces Knee and Hip Flexion During Landing**

Authors: [Amity Campbell, PhD¹](#), [Kevin Kemp-Smith, PT, ScD¹](#), [Peter O'Sullivan, PT, PhD¹](#), [Leon Straker, PT, PhD¹](#)

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2016 Volume:0 Issue:0 Pages:1–23 DOI:10.2519/jospt.2016.5774

Study Design

Controlled Laboratory Study.

Background

Abdominal bracing (AB) is a widely advocated method of increasing spine stability, yet the influence of AB on the execution of sporting movements has not been quantified. Landing is a common task during sporting endeavours, therefore investigating the effect of performing AB during a drop landing task is relevant.

Objective

To quantify the effect of abdominal bracing on kinematics (ankle, knee hip and regional lumbar spine peak flexion angles) and peak vertical ground reaction force (vGRF) during a drop-landing task.

Methods

Sixteen healthy adults (7 females and 9 males, mean [standard deviation] age 27[7] years, height 170.6 [8.1] cm and mass 68.0 [11.3] kg) were assessed using 3D motion analysis, electromyography (EMG) and a force platform while performing a drop landing task with and without AB. AB was achieved with the assistance of real time internal oblique (IO) EMG feedback. Lower limb and regional lumbar spine kinematics, peak vGRF and normalized EMG of the left and right IOs and lumbar multifidus (LM) were quantified. Paired sample t-tests were used to compare variables between the AB and no AB conditions.

Results

AB resulted in significantly reduced knee and hip flexion and increased peak vGRF during landing. No differences in lumbar multifidus EMG or lumbar spine kinematics were observed.

Conclusions

AB reduces impact attenuation during landing. These altered biomechanics may have implications for lower limb and spinal injury risk during dynamic tasks.

Level of Evidence

Level 4. *J Orthop Sports Phys Ther*, Epub 8 Mar 2016. doi:10.2519/jospt.2016.5774

Keyword: [back pain](#), [core stability](#), [exercise](#), [rehabilitation](#)

53. CORE**Strengthening**

Sports Med. 2016 Mar;46(3):401-19. doi: 10.1007/s40279-015-0426-4.

The Role of Trunk Muscle Strength for Physical Fitness and Athletic Performance in Trained Individuals: A Systematic Review and Meta-Analysis.

Prieske O¹, Muehlbauer T², Granacher U².

Author information

Abstract

BACKGROUND:

The importance of trunk muscle strength (TMS) for physical fitness and athletic performance has been demonstrated by studies reporting significant correlations between those capacities. However, evidence-based knowledge regarding the magnitude of correlations between TMS and proxies of physical fitness and athletic performance as well as potential effects of core strength training (CST) on TMS, physical fitness and athletic performance variables is currently lacking for trained individuals.

OBJECTIVE:

The aims of this systematic review and meta-analysis were to quantify associations between variables of TMS, physical fitness and athletic performance and effects of CST on these measures in healthy trained individuals.

DATA SOURCES:

PubMed, Web of Science, and SPORTDiscus were systematically screened from January 1984 to March 2015.

STUDY ELIGIBILITY CRITERIA:

Studies were included that investigated healthy trained individuals aged 16-44 years and tested at least one measure of TMS, muscle strength, muscle power, balance, and/or athletic performance.

STUDY APPRAISAL AND SYNTHESIS METHODS:

Z-transformed Pearson's correlation coefficients between measures of TMS and physical performance were aggregated and back-transformed to r values. Further, to quantify the effects of CST, weighted standardized mean differences (SMDs) of TMS and physical performance were calculated using random effects models. The methodological quality of CST studies was assessed by the Physiotherapy Evidence Database (PEDro) scale.

RESULTS:

Small-sized relationships of TMS with physical performance measures ($-0.05 \leq r \leq 0.18$) were found in 15 correlation studies. Sixteen intervention studies revealed large effects of CST on measures of TMS (SMD = 1.07) but small-to-medium-sized effects on proxies of physical performance ($0 \leq \text{SMD} \leq 0.71$) compared with no training or regular training only. The methodological quality of CST studies was low (median PEDro score = 4).

CONCLUSIONS:

Our findings indicate that TMS plays only a minor role for physical fitness and athletic performance in trained individuals. In fact, CST appears to be an effective means to increase TMS and was associated with only limited gains in physical fitness and athletic performance measures when compared with no or only regular training.

54. POSTURE**Postural cueing****Postural Cueing to Increase Lumbar Lordosis Increases Lumbar Multifidus Activation During Trunk Stabilization Exercises: EMG Assessment Using Intramuscular Electrodes**

Authors: George J. Beneck, PT, PhD, OCS, KEMG¹, John W. Story, MPT, BS, CSCS², Shelby Donald, MPT³

AFFILIATIONS:

Published: *Journal of Orthopaedic & Sports Physical Therapy*,
2016 **Volume:**0 **Issue:**0 **Pages:**1–23 **DOI:**10.2519/jospt.2016.6174

Study Design

Controlled laboratory study, repeated measures design.

Background

Diminished multifidus activation and cross-sectional area is a frequent finding in persons with low back pain. Increasing lumbar lordosis has been shown to increase activation of the multifidus with a minimal increase in activation of the long global extensors during unsupported sitting.

Objectives

To examine the influence of postural cueing to increase lumbar lordosis on lumbar extensor activation during trunk stabilization exercises.

Methods

Thirteen asymptomatic participants (9 males and 4 females) were instructed to perform 6 trunk stabilization exercises using a neutral position and increasing lumbar lordosis. Electrical activity of the deep multifidus and longissimus thoracis was recorded using fine-wire intramuscular electrodes. The mean root-mean-square (RMS) of the EMG signal obtained during each exercise was normalized to a maximum voluntary isometric contraction (MVIC). A two-way repeated measures analysis of variance (posture x exercise) was performed for each muscle.

Results

When averaged across the 6 exercises, postural cueing to increase lumbar lordosis resulted in greater multifidus EMG activity than performing the exercises in a neutral posture ($35.3\% \pm 15.1\%$ vs. $29.5\% \pm 11.1\%$ of MVIC). No significant increase in longissimus thoracis EMG activity was observed when exercising with cueing to increase lumbar lordosis.

Conclusion

This study suggests that postural cueing to increase lumbar lordosis during trunk stabilization exercises may better promote multifidus activation than traditional stabilization exercises alone. Future studies are needed to determine if increasing lumbar lordosis improves multifidus

activation in persons with low back pain. J Orthop Sports Phys Ther, Epub 8 Mar 2016.

doi:10.2519/jospt.2016.6174

Keyword: electromyography, multifidus, trunk stabilization exercises

59. PAIN

Brain responses to pain

AJNR Am J Neuroradiol. 2016 Mar;37(3):430-8. doi: 10.3174/ajnr.A4556. Epub 2015 Nov 5.

Structural Brain Alterations in Community Dwelling Individuals with Chronic Joint Pain.

de Kruijf M¹, Bos D², Huygen FJ³, Niessen WJ⁴, Tiemeier H⁵, Hofman A⁵, Uitterlinden AG⁶, Vernooij MW², Ikram MA⁷, van Meurs JB⁸.

Author information

Abstract

BACKGROUND AND PURPOSE:

Central sensitization in chronic pain involves structural brain changes that influence vulnerability to pain. Identifying brain regions involved in pain processing and sensitization can provide more insight into chronic pain. This study examines structural brain changes in chronic pain and experimental pain in a large population-based study.

MATERIALS AND METHODS:

For 3892 participants in the Rotterdam study, global and regional MR imaging brain volumes were automatically segmented and quantified. Chronic joint pain was defined as pain for more than half of all days during the past 6 weeks. Heat pain thresholds were measured in a subset of 1538 individuals. The association between the presence of chronic joint pain and global and lobar brain volumes was studied. Subsequently, literature was reviewed and the association of chronic pain and heat pain thresholds with 11 brain regions associated with musculoskeletal pain in previous publications was studied.

RESULTS:

Total gray matter volume was smaller in women with chronic pain ($\beta = -0.066$, $P = .016$). This effect was primarily driven by lower gray matter volume in the temporal lobe ($\beta = 0.086$, $P = .005$), the frontal lobe ($\beta = -0.060$, $P = .039$), and the hippocampus ($\beta = -0.099$, $P = .002$). In addition, we observed that a lower heat pain threshold was associated with smaller volumes of the hippocampus ($\beta = 0.017$, $P = .048$), the thalamus ($\beta = 0.018$, $P = .009$), and the anterior cingulate cortex ($\beta = -0.016$, $P = .037$). In men, no significant associations were observed.

CONCLUSIONS:

The primary identified brain areas, the temporal and frontal lobes and the hippocampus, indicated involvement of emotional processing. The volumetric differences found indicated a sex-specific neuroplasticity in chronic pain. These results emphasized sex-specific and multidisciplinary pain treatment.

Eye motion in pain

Eur J Pain. 2016 Mar 7. doi: 10.1002/ejp.851.

Experimental pain induces attentional bias that is modified by enhanced motivation: An eye tracking study.

Sun ZK^{1,2}, Wang JY¹, Luo F¹.

Author information

Abstract

BACKGROUND:

In this study, the effects of prior pain experience and motivation on attentional bias towards pain-related information were investigated within two visual-probe tasks via eye movement behaviours. It is hypothesized that pain experience would induce stronger attentional bias and such bias could be suppressed by the motivation to avoid impending pain.

METHODS:

All participants took part in visual-probe tasks with pictures and words as stimuli that are typically used in studies of attentional bias. They were allocated to three groups: no-pain (NP) group, performing tasks without experiencing pain; pain-experience (PE) group, performing the same tasks following painful stimuli; and pain-experience-with-motivation (PEM) group, undergoing the same procedure as PE group with additional instructions about avoiding impending pain. Eye movements were recorded during the tasks.

RESULTS:

The eye movement data showed that: (1) participants in the PE group exhibited stronger attention bias towards painful pictures than those in the NP group; (2) the attentional bias towards painful pictures was significantly reduced in the PEM group as compared to the PE group. By contrast, the verbal task failed to find these effects using sensory pain words as stimuli.

CONCLUSION:

This study was the first that revealed the impact of acute experimental pain on attentional bias towards pain-related information in healthy individuals through eye tracking. It may provide a possible solution to reduce hypervigilance towards pain-related information by altering the motivational relevance. **WHAT DOES THIS STUDY ADD?:** (1) This study revealed the impact of experimental pain on attentional bias in healthy individuals; (2) This study may provide a possible approach of altering motivational relevance to control the pain-induced attentional bias towards pain-related information.