

ABSTRACTS

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2. LBP

LBP and sitting

Park, R. J., et al. (2013).

Recruitment of discrete regions of the psoas major and quadratus lumborum muscles is changed in specific sitting postures in individuals with recurrent low back pain.

J Orthop Sports Phys Ther **43**(11): 833-840.

STUDY DESIGN: Cross-sectional controlled laboratory study.

OBJECTIVES: To investigate potential changes in the function of discrete regions of the psoas major (PM) and quadratus lumborum (QL) with changes in spinal curvatures and hip positions in sitting, in people with recurrent low back pain (LBP).

BACKGROUND: Although the PM and QL contribute to control of spinal curvature in sitting, whether activity of these muscles is changed in individuals with LBP is unknown.

METHODS: Ten volunteers with recurrent LBP (pain free at the time of testing) and 9 pain-free individuals in a comparison group participated. Participants with LBP were grouped into those with high and low erector spinae (ES) electromyographic (EMG) signal amplitude, recorded when sitting with a lumbar lordosis. Data were recorded as participants assumed 3 sitting postures. Fine-wire electrodes were inserted with ultrasound guidance into fascicles of the PM arising from the transverse process and vertebral body, and the anterior and posterior layers of the QL.

RESULTS: When data from those with recurrent LBP were analyzed as 1 group, PM and QL EMG signal amplitudes did not differ between groups in any of the sitting postures. However, when subgrouped, those with low ES EMG had greater EMG signal amplitude of the PM vertebral body and QL posterior layer in flat posture and greater EMG signal amplitude of the QL posterior layer in short lordotic posture, compared to those in the pain-free group. For the group with high ES EMG, the PM transverse process and PM vertebral body EMG was less than that of the other LBP group in short lordotic posture.

CONCLUSION: The findings suggest a redistribution of activity between muscles that have a potential extensor moment in individuals with LBP. The modification of EMG of discrete fascicles of the PM and QL was related to changes in ES EMG signal amplitude recorded in sitting.

Early PT helps LBP

JAMA. 2015 Oct 13;314(14):1459-67. doi: 10.1001/jama.2015.11648.

Early Physical Therapy vs Usual Care in Patients With Recent-Onset Low Back Pain: A Randomized Clinical Trial.

Fritz JM¹, Magel JS², McFadden M¹, Asche C³, Thackeray A², Meier W¹, Brennan G⁴.
Author information

Abstract

IMPORTANCE: Low back pain (LBP) is common in primary care. Guidelines recommend delaying referrals for physical therapy.

OBJECTIVE: To evaluate whether early physical therapy (manipulation and exercise) is more effective than usual care in improving disability for patients with LBP fitting a decision rule.

DESIGN, SETTING, AND PARTICIPANTS: Randomized clinical trial with 220 participants recruited between March 2011 and November 2013. Participants with no LBP treatment in the past 6 months, aged 18 through 60 years (mean age, 37.4 years [SD, 10.3]), an Oswestry Disability Index (ODI) score of 20 or higher, symptom duration less than 16 days, and no symptoms distal to the knee in the past 72 hours were enrolled following a primary care visit.

INTERVENTIONS: All participants received education. Early physical therapy (n = 108) consisted of 4 physical therapy sessions. Usual care (n = 112) involved no additional interventions during the first 4 weeks.

MAIN OUTCOMES AND MEASURES: Primary outcome was change in the ODI score (range: 0-100; higher scores indicate greater disability; minimum clinically important difference, 6 points) at 3 months. Secondary outcomes included changes in the ODI score at 4-week and 1-year follow-up, and change in pain intensity, Pain Catastrophizing Scale (PCS) score, fear-avoidance beliefs, quality of life, patient-reported success, and health care utilization at 4-week, 3-month, and 1-year follow-up.

RESULTS: One-year follow-up was completed by 207 participants (94.1%). Using analysis of covariance, early physical therapy showed improvement relative to usual care in disability after 3 months (mean ODI score: early physical therapy group, 41.3 [95% CI, 38.7 to 44.0] at baseline to 6.6 [95% CI, 4.7 to 8.5] at 3 months; usual care group, 40.9 [95% CI, 38.6 to 43.1] at baseline to 9.8 [95% CI, 7.9 to 11.7] at 3 months; between-group difference, -3.2 [95% CI, -5.9 to -0.47], P = .02). A significant difference was found between groups for the ODI score after 4 weeks (between-group difference, -3.5 [95% CI, -6.8 to -0.08], P = .045), but not at 1-year follow-up (between-group difference, -2.0 [95% CI, -5.0 to 1.0], P = .19). There was no improvement in pain intensity at 4-week, 3-month, or 1-year follow-up (between-group difference, -0.42 [95% CI, -0.90 to 0.02] at 4-week follow-up; -0.38 [95% CI, -0.84 to 0.09] at 3-month follow-up; and -0.17 [95% CI, -0.62 to 0.27] at 1-year follow-up). The PCS scores improved at 4 weeks and 3 months but not at 1-year follow-up (between-group difference, -2.7 [95% CI, -4.6 to -0.85] at 4-week follow-up; -2.2 [95% CI, -3.9 to -0.49] at 3-month follow-up; and -0.92 [95% CI, -2.7 to 0.61] at 1-year follow-up). There were no differences in health care utilization at any point.

CONCLUSIONS AND RELEVANCE: Among adults with recent-onset LBP, early physical therapy resulted in statistically significant improvement in disability, but the improvement was modest and did not achieve the minimum clinically important difference compared with usual care.

TRIAL REGISTRATION: clinicaltrials.gov Identifier: [NCT01726803](https://clinicaltrials.gov/ct2/show/study/NCT01726803).

PMID: 26461996

3. DISC

Standing and sitting disc pressures

Claus, A., et al. (2008).

Sitting versus standing: does the intradiscal pressure cause disc degeneration or low back pain?

J Electromyogr Kinesiol **18**(4): 550-558.

Studies of lumbar intradiscal pressure (IDP) in standing and upright sitting have mostly reported higher pressures in sitting.

It was assumed clinically that flexion of the lumbar spine in sitting relative to standing, caused higher IDP, disc degeneration or rupture, and low back pain. IDP indicates axial compressive load upon a non-degenerate disc, but provides little or no indication of shear, axial rotation or bending.

This review is presented in two main parts. First, in vivo IDP data in standing and upright sitting for non-degenerate discs are comprehensively reviewed. As methodology, results and interpretations varied between IDP studies, in vivo studies measuring spinal shrinkage and spinal internal-fixator loads to infer axial compressive load to the discs are also reviewed. When data are considered together, it is clear that IDP is often similar in standing and sitting.

Secondly, clinical assumptions related to IDP in sitting are considered in light of basic and epidemiologic studies. Current studies indicate that IDP in sitting is unlikely to pose a threat to non-degenerate discs, and sitting is no worse than standing for disc degeneration or low back pain incidence. If sitting is a greater threat for development of low back pain than standing, the mechanism is unlikely to be raised IDP.

Degeneration

Spine J. 2015 Oct 1;15(10):2117-21. doi: 10.1016/j.spinee.2014.08.446.

Can specific loading through exercise impart healing or regeneration of the intervertebral disc?

Steele J¹, Bruce-Low S², Smith D³, Osborne N⁴, Thorkeldsen A⁴.
Author information

Abstract

BACKGROUND CONTEXT: Low back pain (LBP) is highly prevalent and presents an enormous cost both through direct health care and indirectly through significant work and production loss. Low back pain is acknowledged widely to be a multifactorial pathology with a variety of symptoms, dysfunctions, and a number of possible sources of pain. One source that has been suspected and evidenced for some time is the intervertebral disc. Some degree of disc degeneration is a physiologic process associated with aging, however, more severe degeneration and/or structural abnormality may be indicative of a pathologic process or injury and is more commonly present in those suffering from LBP. Much like other tissues (ie, muscle, bone, etc.), it has been suspected that there exists an optimal loading strategy to promote the health of the disc. Exercise is often prescribed for LBP and effectively reduces pain and disability. However, whether specific loading through exercise might plausibly heal or regenerate the intervertebral discs is unknown.

PURPOSE: To examine the effects of loading on regenerative processes in the intervertebral disc and consider the potential for specific exercise to apply loading to the lumbar spine to produce these effects.

STUDY DESIGN: A brief narrative literature review.

METHODS: Studies examining the effects of loading on the intervertebral discs were reviewed to examine the plausibility of using loading through exercise to induce regeneration or healing of the intervertebral disc.

RESULTS: Research from animal model studies suggests the existence of a dose-response relationship between loading and regenerative processes. Although high loading at high volumes and frequencies might accelerate degeneration or produce disc injury, high loading, yet of low volume and at low frequency appears to induce potentially regenerative mechanisms, including improvements in disc proteoglycan content, matrix gene expression, rate of cell apoptosis, and improved fluid flow and solute transport.

CONCLUSIONS: Research suggests a dose-response relationship between loading and disc regenerative processes and that the loading pattern typically used in the lumbar extension resistance exercise interventions (high load, low volume, and low frequency) might impart healing or regeneration of the intervertebral discs. Future research should examine an exercise intervention with in vivo measurement of changes in disc condition. This may provide further evidence for the "black box" of treatment mechanisms associated with exercise interventions.

KEYWORDS: Disc; Injury; Low back pain; MRI; Resistance training; Review; Strength training; Therapy

PMID:26409630

7. PELVIC ORGANS/WOMAN'S HEALTH

Pelvic girdle pain in pregnancy

BMC Pregnancy Childbirth. 2015 Oct 5;15(1):237. doi: 10.1186/s12884-015-0667-0.

The association between pelvic girdle pain and sick leave during pregnancy; a retrospective study of a Norwegian population.

Malmqvist S^{1,2}, Kjaermand I³, Andersen K^{4,5}, Økland I⁶, Larsen JP⁷, Brønnick K⁸.
Author information

Abstract

BACKGROUND:

The incidence of pelvic girdle pain (PGP) in pregnancy is wide ranged depending on definition, the utilised diagnostic means, and the design of the studies. PGP during pregnancy has negative effects on activities of daily living and causes long sick leave, which makes it a major public health issue. Our objectives were to explore the frequency of sick leave in pregnancy due to PGP, assess the relationship between different types of pain-related activities of daily living, examine physical workload, type of work in relation to sick leave, and to explore factors that make women less likely to take sick leave for PGP.

METHODS:

All women giving birth at the maternity ward of Stavanger University Hospital, Norway, were asked to participate and complete a questionnaire on demographic features, PGP, pain-related activities of daily living, sick leave in general and for PGP, frequency of exercising before and during pregnancy. Drawings of pelvic girdle and low back area were used for the localization of pain. PGP intensity was then rated retrospectively on a numerical rating scale. Non-parametric tests, multinomial logistic regression and sequential linear regression analysis were used in the statistical analysis.

RESULTS:

PGP is a frequent and major cause of sick leave during pregnancy among Norwegian women, which is also reflected in activities of daily living as measured with scores on all Oswestry disability index items. In the multivariate analysis of factors related to sick leave and PGP we found that work satisfaction, problems with lifting and sleeping, and pain intensity were risk factors for sick leave. In addition, women with longer education, higher work satisfaction and fewer problems with sitting, walking and standing, were less likely to take sick leave in pregnancy, despite the same pain intensity as women being on sick leave.

CONCLUSIONS:

A coping factor in pregnant women with PGP was discovered, most likely dependant on education, associated with work situation and/or work posture, which decreases sick leave. We recommend these issues to be further examined in a prospective longitudinal study since it may have important implications for sick leave frequency during pregnancy.

PMID:6437972

Nutrition and prostrate CA

Am J Clin Nutr. 2015 Oct 7. pii: ajcn114306.

Carotenoids, retinol, tocopherols, and prostate cancer risk: pooled analysis of 15 studies.

Key TJ¹, Appleby PN², Travis RC², Albanes D³, Alberg AJ⁴, Barricarte A⁵, Black A³, Boeing H⁶, Bueno-de-Mesquita HB⁷, Chan JM⁸, Chen C⁹, Cook MB³, Donovan JL¹⁰, Galan P¹¹, Gilbert R¹⁰, Giles GG¹², Giovannucci E¹³, Goodman GE¹⁴, Goodman PJ¹⁵, Gunter MJ¹⁶, Hamdy FC¹⁷, Heliövaara M¹⁸, Helzlsouer KJ¹⁹, Henderson BE²⁰, Hercberg S¹¹, Hoffman-Bolton J²¹, Hoover RN³, Johansson M²², Khaw KT²³, King IB²⁴, Knekt P¹⁸, Kolonel LN²⁵, Le Marchand L²⁵, Männistö S¹⁸, Martin RM²⁶, Meyer HE²⁷, Mondul AM³, Moy KA³, Neal DE²⁸, Neuhauser ML²⁹, Palli D³⁰, Platz EA³¹, Pouchieu C¹², Rissanen H¹⁸, Schenk JM³², Severi G¹², Stampfer MJ¹³, Tjønneland A³³, Touvier M¹¹, Trichopoulos A³⁴, Weinstein SJ³, Ziegler RG³, Zhou CK³, Allen NE³⁵; Endogenous Hormones Nutritional Biomarkers Prostate Cancer Collaborative Group.

Author information

Abstract

BACKGROUND: Individual studies have suggested that circulating carotenoids, retinol, or tocopherols may be associated with prostate cancer risk, but the studies have not been large enough to provide precise estimates of associations, particularly by stage and grade of disease.

OBJECTIVE: The objective of this study was to conduct a pooled analysis of the associations of the concentrations of 7 carotenoids, retinol, α -tocopherol, and γ -tocopherol with risk of prostate cancer and to describe whether any associations differ by stage or grade of the disease or other factors.

DESIGN: Principal investigators of prospective studies provided individual participant data for prostate cancer cases and controls. Risk by study-specific fifths of each biomarker was estimated by using multivariable-adjusted conditional logistic regression in matched case-control sets.

RESULTS: Data were available for up to 11,239 cases (including 1654 advanced stage and 1741 aggressive) and 18,541 controls from 15 studies. Lycopene was not associated with overall risk of prostate cancer, but there was statistically significant heterogeneity by stage of disease, and the OR for aggressive disease for the highest vs. the lowest fifth of lycopene was 0.65 (95% CI: 0.46, 0.91; P-trend = 0.032). No other carotenoid was significantly associated with overall risk of prostate cancer or with risk of advanced-stage or aggressive disease. For retinol, the OR for the highest vs. the lowest fifth was 1.13 (95% CI: 1.04, 1.22; P-trend = 0.015). For α -tocopherol, the OR for the highest vs. the lowest fifth was 0.86 (95% CI: 0.78, 0.94; P-trend < 0.001), with significant heterogeneity by stage of disease; the OR for aggressive prostate cancer was 0.74 (95% CI: 0.59, 0.92; P-trend = 0.001). γ -Tocopherol was not associated with risk.

CONCLUSIONS: Overall prostate cancer risk was positively associated with retinol and inversely associated with α -tocopherol, and risk of aggressive prostate cancer was inversely associated with lycopene and α -tocopherol. Whether these associations reflect causal relations is unclear.

KEYWORDS: biomarkers; carotenoids; nested case-control study; pooled analysis; prostate cancer; retinol; tocopherols; vitamin A; vitamin E

PMID:26447150

Celiac disease and higher rates of obstetric complications

Am J Obstet Gynecol. 2015 Sep 29. pii: S0002-9378(15)01194-1. doi: 10.1016/j.ajog.2015.09.080.

Celiac disease and obstetric complications: a systematic review and meta-analysis.

Saccone G¹, Berghella V², Sarno L¹, Maruotti GM¹, Cetin I³, Greco L⁴, Khashan AS⁵, McCarthy F⁶, Martinelli D⁷, Fortunato F⁷, Martinelli P⁸.

Author information

Abstract

OBJECTIVE: The aim of this meta-analysis was to evaluate the risk of developing obstetric complications in women with celiac disease.

DATA SOURCES: Electronic databases were searched from their inception until February 2015.

STUDY ELIGIBILITY CRITERIA: We included all cohort studies reporting the incidence of obstetric complications in women with celiac disease compared to women without celiac disease (i.e. control group). Studies without a control group and case-control studies were excluded.

STUDY APPRAISAL AND SYNTHESIS METHODS: The primary outcome was defined a priori and was the incidence of a composite of obstetric complications including intrauterine growth restriction (IUGR), small for gestational age (SGA), low birth weight (LBW), preeclampsia and preterm birth (PTB). Secondary outcomes included the incidence of PTB, IUGR, stillbirth, preeclampsia, SGA and LBW. The review was registered with PROSPERO (CRD42015017263) before data extraction. All authors were contacted in order to obtain the original databases and perform individual participant data (IPD) meta-analysis. Primary and secondary outcomes were assessed in the aggregate data analysis as well as in the IPD meta-analysis.

RESULTS: We included 10 cohort studies (4,844,555 women) in this meta-analysis. Four authors kindly provided the entire databases for the IPD analysis. Since that none of the included studies stratified data for the primary outcome (i.e. composite outcome) assessing this outcome for the aggregate analysis was not feasible. Aggregate data analysis showed that, compared to women in the control group, women with celiac disease (both treated and untreated) had a significantly higher risk of developing PTB (aOR 1.35, 95% CI 1.09 to 1.66), IUGR (OR 2.48, 95% CI 1.32 to 4.67), stillbirth (OR 4.84, 95% CI 1.08 to 21.75), LBW (OR 1.63, 95% CI 1.06 to 2.51), and SGA (OR 4.52; 95% CI 1.02 to 20.08), while no statistically significant difference was found in the incidence of preeclampsia (OR 2.45, 95% CI 0.90 to 6.70). The risk of PTB was still significantly higher both in subgroup analysis of only diagnosed and treated celiac disease women (OR 1.26, 95% CI 1.06 to 1.48) and in subgroup analysis of only undiagnosed and untreated celiac disease women (OR 2.50, 95% CI 1.06 to 5.87). Women with diagnosed and treated celiac disease had a significantly lower risk of developing PTB compared to undiagnosed and untreated celiac disease (OR 0.80, 95% CI 0.64 to 0.99). The IPD meta-analysis showed that women with celiac disease had a significantly higher risk of composite obstetric complications compared to controls (OR 1.51, 95% CI 1.17 to 1.94). Our IPD concurs with the aggregate analysis for all the secondary outcomes.

CONCLUSIONS: In summary, women with celiac disease had a significantly higher risk of developing obstetric complications including PTB, IUGR, stillbirth, LBW and SGA.

KEYWORDS: Preterm birth; celiac disease; metaanalysis; pregnancy; small for gestational age
PMID:26432464

8. VISCERA

Self-management of IBS

Clin Gastroenterol Hepatol. 2015 Oct 7. pii: S1542-3565(15)01329-4. doi: 10.1016/j.cgh.2015.09.027.

A Comprehensive Self-Management Irritable Bowel Syndrome Program Produces Sustainable Changes in Behavior After 1 Year.

Zia JK¹, Barney P², Cain KC², Jarrett ME², Heitkemper MM².
Author information

Abstract

BACKGROUND & AIMS:

We developed a comprehensive self-management (CSM) program that combines cognitive behavioral therapy with relaxation and dietary strategies; 9 sessions (1 hr each) over 13 weeks were shown to reduce gastrointestinal symptoms and increase quality of life in a randomized trial of patients with irritable bowel syndrome (IBS), compared to usual care. The aims of this study were to describe strategies IBS patients selected and continued to use, 12 months after the CSM program began.

METHODS:

We performed a cohort study to continue to follow 81 adults with IBS (87% female; mean age 45±15 years old) who received the CSM program in the previous clinical trial. During the last CSM session, participants selected strategies they intended to continue using to manage their IBS. CSM strategies were categorized into subthemes of diet (composition, trigger foods, meal size or timing, and eating behaviors), relaxation (specific relaxation strategies and lifestyle behaviors), and alternative thoughts (identifying thought distortions, challenging underlying beliefs, and other strategies). Twelve months later, participants were asked how often they used each strategy (not at all or rarely, occasionally, often, very often, or almost always).

RESULTS:

At the last CSM session, 95% of the patients selected the subthemes of specific relaxation strategies, 90% selected diet composition, and 90% identified thought distortions (90%) for continued use. At 12 months, 94% of the participants (76/81) were still using at least 6 strategies, and adherence was greater than 79% for all subthemes.

CONCLUSIONS:

We developed a CSM program to reduce symptoms and increase quality of life in patients with IBS that produced sustainable behavioral changes in almost all patients (94%) after 1 year of follow up.

KEYWORDS: alternative medicine; behavioral therapy; psychology; self-management

PMID: 26453951

IBS and Urinary infections

Urolithiasis and urinary tract infection among patients with inflammatory bowel disease: A review of US emergency department visits between 2006 and 2009

The Journal of Emergency Medicine, 10/20/2015

Varda BK, et al.

Patients with inflammatory bowel disease (IBD) are susceptible to both infection and urolithiasis. The compounding factors of immunosuppression, primary and secondary malabsorptive syndromes, and the resulting chronic malnutrition, dehydration, and metabolic derangements put these patients at risk for urinary stone formation, multiple/recurrent stones, infected stones, and severe clinical sequelae. Urolithiasis is present in more than 25% of patients with IBD, and IBD patients hospitalized with urinary tract infection (UTI) have a significant mortality risk.

Gluten and celiac disease in infants

Clin Gastroenterol Hepatol. 2015 Oct 7. pii: S1542-3565(15)01332-4. doi: 10.1016/j.cgh.2015.09.030.

Effects of Gluten Intake on Risk of Celiac Disease: a case-control study on a Swedish birth cohort.

Andrén Aronsson C¹, Lee HS², Koletzko S³, Uusitalo U², Yang J², Virtanen SM⁴, Liu E⁵, Lernmark Å¹, Norris JM⁶, Agardh D⁷; TEDDY Study Group.

Author information

Abstract

BACKGROUND & AIMS:

It is not clear how intake of gluten during infancy affects subsequent risk of celiac disease. We investigated whether gluten intake before 2 years of age increases risk for celiac disease in genetically susceptible children.

METHODS:

We performed a case-control study of 436 pairs of children, generated from a database of 2525 children with genetic susceptibility to celiac disease in Sweden, matched for sex, birth year, and HLA genotype from September 2004 and February 2010. Children were screened annually for celiac disease using an assay for tissue transglutaminase autoantibodies (tTGA). Intestinal biopsies were collected from children who tested positive for tTGA to confirm the presence of celiac disease. Gluten intake was calculated from 3-day food records collected when the children were 9, 12, 18 and 24 months old.

RESULTS:

Breastfeeding duration (median 32 weeks) and age at first introduction to gluten (median 22 weeks) did not differ between cases and tTGA-negative children (controls). At the visit prior to tTGA seroconversion, cases reported a larger intake of gluten (median 4.9 g/day) than controls (median 3.9 g/day) (odds ratio [OR], 1.28; 95% confidence interval [CI], 1.13-1.46; P=.0002). More cases consumed amounts of gluten in the upper 3rd tertile (i.e. >5.0 g/day) before they tested positive for tTGA seroconversion than controls (OR, 2.65; 95% CI, 1.70-4.13; P<.0001). This increase in risk was similar for children homozygous for DR3-DQ2 (OR, 3.19; 95% CI, 1.61-6.30; P=.001), heterozygous for DR3-DQ2 (OR, 2.24; 95% CI, 1.08-4.62; P=.030), and for children not carrying DR3-DQ2 (OR, 2.43; 95% CI, 0.90-6.54; P=.079).

CONCLUSIONS:

Intake of gluten before 2 years of age increases risk of celiac disease at least 2-fold in children with genetic risk factors for this disease. This association did not differ among HLA-DR3-DQ2 haplotypes. These findings may be taken into account for future infant feeding recommendations.

KEYWORDS: TEDDY study; diet; pediatric; wheat

PMID: 26453955

Atrial fibrillation and increased dementia

JAMA Neurol. 2015 Sep 21;1-7. doi: 10.1001/jamaneurol.2015.2161.

Association Between Atrial Fibrillation and Dementia in the General Population.

de Bruijn RF¹, Heeringa J², Wolters FJ¹, Franco OH², Stricker BH², Hofman A², Koudstaal PJ³, Ikram MA⁴.

Author information

Abstract

IMPORTANCE:

Atrial fibrillation (AF) has been suggested as a risk factor for dementia since it may lead to chronic cerebral hypoperfusion and stroke. However, longitudinal studies assessing the association between AF and dementia have shown inconsistent results.

OBJECTIVE:

To determine the effect of AF on the risk of developing dementia during 20 years of follow-up.

DESIGN, SETTING, AND PARTICIPANTS:

The association of prevalent and incident AF with incident dementia was assessed from July 6, 1989, to February 4, 2010, in 6514 dementia-free participants in the prospective population-based Rotterdam Study. Data analysis was conducted from September 18, 2014, to April 17, 2015. Cox proportional hazards regression models adjusting for age, sex, and cardiovascular risk factors; censored for stroke; and stratified by median age were used. In addition, we investigated whether the association between incident AF and dementia varied according to the duration of exposure, categorized in 6-year time bands.

EXPOSURES:

Prevalent and incident AF.

MAIN OUTCOMES AND MEASURES:

Incident dementia, determined according to the Diagnostic and Statistical Manual of Mental Disorders (Third Edition Revised) and the National Institute of Neurological and Communicative Disorders and Stroke-Alzheimer's Disease and Related Disorders Association criteria.

RESULTS:

At baseline, 318 of 6514 participants (4.9%) had prevalent AF, and during 81 483 person-years of follow-up, 994 participants (15.3%) developed incident dementia. With findings presented as adjusted hazard ratio (95% CI), prevalent AF was related to an increased risk of dementia (1.33; 1.02-1.73). Among 6196 participants without prevalent AF during 79 003 person-years of follow-up, 723 participants (11.7%) developed incident AF and 932 individuals (15.0%) developed incident dementia. Incident AF was associated with an increased risk of dementia in younger participants (<67 years: 1.81; 1.11-2.94 vs ≥67 years: 1.12; 0.85-1.46; P = .02 for interaction). The risk of dementia was strongly associated with duration of exposure to AF in the younger participants (in the highest stratum: 3.30; 1.16-9.38; P = .003 for trend) but not in the elder participants (0.25; 0.04-1.86; P = .94 for trend).

CONCLUSIONS AND RELEVANCE:

Atrial fibrillation is associated with an increased risk of dementia, independent of clinical stroke. This association was strongest for younger participants with the longest duration of AF. Future studies should investigate whether optimal treatment of AF can prevent or postpone dementia.

PMID: 26389654

10 A. CERVICAL SPINE**Disc and facet**

Eur Spine J. 2015 Oct 3.

Relationship between modic changes and facet joint degeneration in the cervical spine.

Park MS¹, Moon SH², Kim TH³, Lee SY³, Jo YG³, Riew KD⁴.

Author information

Abstract

PURPOSE:

Given that the disc moves simultaneously with facet joints, there would be a relationship between Modic changes and facet joint degeneration in the cervical spine. However, there is no literature investigating the relationship. The purpose is to evaluate the relationship between Modic changes and facet joint degeneration in the cervical spine.

METHODS:

Ninety-eight patients underwent both computed tomography (CT) and magnetic resonance images (MRI) of the cervical spine. They consisted of fifty-one males and forty-eight females and their mean age was 60.1 years (ranged from 40 years to 81 years). We compared the degree of facet joint degeneration based on CTs with Modic changes based on MRIs from C2-C3 to C6-C7. The degree of facet joint degeneration was classified into four categories and Modic changes were classified into four types. Disc degeneration was determined with Miyazaki's grading system.

RESULTS:

Facet joint degeneration was most common at C2-C3 and C4-C5 and rarest at C6-C7. Modic changes were most common at C2-C3 and rarest at C6-C7. However, there was no relationship between facet joint degeneration and any Modic changes at the same level. However, the presence of facet joint degeneration and the presence of Modic change are common in high grades of disc degeneration at the same level of the cervical spine.

CONCLUSION:

Modic changes and facet joint degeneration are most common at C2-C3 in the cervical spine. However, there were no relationships between the presence of Modic changes and facet joint degeneration at the same level of the cervical spine.

KEYWORDS: Cervical spine; Disc degeneration; Facet joint degeneration; Modic changes

PMID:26433585

Impaired proprioception

Phys Ther. 2015 Oct 15.

Evidence of Impaired Proprioception in Chronic, Idiopathic Neck Pain: Systematic Review and Meta-Analysis.

Stanton TR¹, Leake HB², Chalmers KJ³, Moseley GL⁴.
Author information

Abstract

BACKGROUND:

Despite common use of proprioceptive retraining interventions in chronic, idiopathic neck pain, evidence that proprioceptive dysfunction exists in this population is lacking. Determining whether proprioceptive dysfunction exists in chronic neck pain has clear implications for treatment prescription.

PURPOSE:

We aimed to synthesize and critically appraise all evidence evaluating proprioceptive dysfunction in those with chronic, idiopathic neck pain by completing a systematic review and meta-analysis.

DATA SOURCES:

Medline, CINAHL, Pubmed, Allied and Complementary Medicine, EMBASE, Academic Search Premier, Scopus, Physiotherapy Evidence Database (PEDro), and the Cochrane Collaboration databases were searched.

STUDY SELECTION:

All published studies that compared neck proprioception (joint position sense) between a chronic, idiopathic neck pain sample and asymptomatic controls were included.

DATA EXTRACTION:

Two independent reviewers extracted relevant population and proprioception data and assessed methodological quality using a modified STROBE statement.

DATA SYNTHESIS:

Thirteen studies were included in the present review. Meta-analysis on ten studies demonstrated that those with chronic neck pain perform significantly worse on 'head-to-neutral' repositioning tests, with a moderate standardized mean difference (SMD) of 0.44 (95% confidence interval: 0.25 to 0.63). Two studies evaluated head repositioning using trunk movement (no active head movement thus hypothesised to remove vestibular input) and found conflicting results. Three studies evaluated complex/postural repositioning tests: postural repositioning was no different between groups and complex movement tests were only impaired in chronic neck pain if error was continuously evaluated throughout the movement.

LIMITATIONS:

A paucity of studies evaluating complex/postural repositioning tests does not permit us to make any solid conclusions about them.

CONCLUSIONS:

People with chronic, idiopathic neck pain demonstrate a moderate impairment in 'head-to-neutral' repositioning tests, when compared with asymptomatic controls.

PMID:26472296

Tropisms and spondylolisthesis

Spine J. 2015 Sep 24. pii: S1529-9430(15)01445-X. doi: 10.1016/j.spinee.2015.09.035.

Cervical degenerative spondylolisthesis: analysis of facet orientation and the severity of cervical spondylolisthesis.

Xu C¹, Lin B², Ding Z³, Xu Y².

Author information

Abstract

BACKGROUND CONTEXT: Previous studies have shown an association between the degree of cervical degenerative spondylolisthesis and spinal cord conditions of the cervical spine. However, there is no information available on the association between the severity of cervical degenerative spondylolisthesis and the orientation of the cervical facet joints. This study examined the association between the severity of cervical degenerative spondylolisthesis and facet tropism.

PURPOSE: To retrospectively explore the relationship between facet tropism and cervical degenerative spondylolisthesis and the effect of facet tropism on cervical degenerative spondylolisthesis.

STUDY DESIGN: Retrospective review of radiographic and magnetic resonance imaging (MRI) findings in patients with or without cervical degenerative spondylolisthesis.

PATIENT SAMPLE: A total of 200 patients from a single institution who underwent both MRI and radiography were reviewed.

OUTCOME MEASURES: The facet angles at the C3-C4, C4-C5 and C5-C6 levels based on axial MRI in the two groups and the slippage degree at C4-C5 based on neutral lateral radiographs in the experimental group were measured and calculated.

METHODS: One hundred patients with only C4-C5 level cervical degenerative spondylolisthesis who were treated in our hospital from January 2005 to August 2011 were selected as the experimental group. One hundred age- and sex-matched spinal disease-free patients were selected as the control group from patients who presented for physical examinations. Comparative analysis of the obtained parameters was performed to determine significant differences between the examined levels in the two groups and to investigate the association between cervical degenerative spondylolisthesis and facet tropism.

RESULTS: Facet tropism at C4-C5 was significantly greater than that at C3-C4 and C5-C6 in the experimental group (C4-C5 vs. C3-C4, $P < .001$; C4-C5 vs. C5-C6, $P < .001$), but there were no significant differences between the examined levels in the control group ($P = .075$). Facet tropism at C4-C5 in the moderate spondylolisthesis patients was significantly greater than that in the severe spondylolisthesis patients ($P = .036$), but facet tropism severity did not vary with the degree of spondylolisthesis in the experimental group ($P = .108$).

CONCLUSIONS: This study revealed that facet tropism is universally present at the C3-C4, C4-C5 and C5-C6 levels and that the greatest degree of facet tropism exists in spondylolisthesis-affected levels. Although there was no significant correlation between facet tropism severity and the degree of spondylolisthesis, facet tropism was found to increase the risk of the development of spondylolisthesis. This finding suggested that facet tropism may play a significant role in cervical degenerative spondylolisthesis.

KEYWORDS: Cervical degenerative spondylolisthesis; Facet joints; Facet tropism; MRI; Radiography [PMID:26409420](#)

13. CRANIUM/TMJ

Trigeminal neuralgia

Cephalalgia. 2015 Oct 19. pii: 0333102415611405.

Trigeminal neuralgia (part I): Revisiting the clinical phenotype.

Haviv Y¹, Khan J², Zini A³, Almoznino G⁴, Sharav Y¹, Benoliel R⁵.

Author information

Abstract

AIMS:

We conducted a cross-sectional study to re-examine the clinical profile of patients with a clinical diagnosis of classical trigeminal neuralgia (CTN).

METHODS:

Inclusion criteria consisted of the International Headache Society's published classification of CTN. For the specific purposes of the study, features such as autonomic signs, persistent background pain, attack durations of >2 minutes and reports of pain-related awakening were included. The demographic and clinical phenotype of each patient were carefully recorded for analysis.

RESULTS:

The study cohort consisted of 81 patients and based on reported attack duration these were divided into short (≤ 2 minutes, $n = 61$) and long (> 2 minutes, $n = 20$) groups for further analysis. The group with short attack duration neatly fit most of the criteria for CTN while the long attack group presents a more challenging diagnosis. There were no significant differences in pain severity, quality and location between the short and long attack groups. The frequency of persistent background pain was significantly higher in the long (70%) compared to the short attack group (29.5%, $p = 0.001$). There were significantly more reports of pain-related awakenings in the long (55%) than in the short attack groups (29.5%, $p = 0.04$). There were no significant differences in the frequency of autonomic signs between the short (21.3%) and long attack groups (40%, $p = 0.1$). In the short attack group, the presence of autonomic signs was significantly associated with longer disease duration, increased pain-related awakenings, and a reduced prognosis.

CONCLUSION:

There are clear diagnostic criteria for CTN but often patients present with features, such as long pain attacks, that challenge such accepted criteria. In our cohort the clinical phenotype of trigeminal, neuralgiform pain with or without autonomic signs and background pain was observed across both short and long attack groups and the clinical implications of this are discussed.

KEYWORDS: SUNA; Trigeminal autonomic cephalalgia; autonomic signs; neuropathic pain

PMID:26481304

Tongue color

BMC Complement Altern Med. 2015 Oct 16;15(1):372. doi: 10.1186/s12906-015-0904-0.

The association between objective tongue color and endoscopic findings: results from the Kyushu and Okinawa population study (KOPS).

Kainuma M^{1,2}, Furusyo N³, Urita Y⁴, Nagata M⁵, Ihara T⁶, Oji T⁷, Nakaguchi T⁸, Namiki T⁹, Hayashi J¹⁰.

Author information

Abstract

BACKGROUND:

The relation between tongue color and gastroesophageal disease is unclear. This study was done to investigate the associations between tongue color (TC), endoscopic findings, Helicobacter.pylori infection status, and serological atrophic gastritis (SAG).

METHODS:

The participants were 896 residents of Ishigaki Island, Okinawa, aged 28-86 years. The tongue was photographed, esophagogastroduodenoscopy was done, and serum antibody to H.pylori was measured. SAG was defined as a serum Pepsinogen (PG)I level ≤ 70 ng/ml and a PGI/II ratio ≤ 3.0 . TC was measured by the device-independent international commission on Illumination 1976 L*a*b* color space standards at four points: (1) edge, (2) posterior, (3) middle, and (4) apex. We also calculated the ratio of the tongue edge to the three other measured points to examine the association between the coating of the tongue and the endoscopic and laboratory findings.

RESULTS:

Participants were excluded who had two or more endoscopic findings (n = 315) or who had SAG without seropositivity to H.pylori (n = 33). The remaining 548 participants were divided into three groups: SAG and seropositive to H.pylori (n = 67), seropositive to H.pylori alone (n = 56), and without SAG and seronegative for H.pylori (n = 425). We divided 425 residents into a single endoscopic finding positive group (n = 207) and a negative group, which served as a control (n = 218). The most frequent single endoscopic finding was esophageal hernia (n = 110), followed by erosive esophagitis (n = 35) and erosive gastritis (EG) (n = 45). EH was significantly associated with TC (2b*/1b*) (P < 0.05). EG was significantly associated with TC (3a*, 3b*) (P < 0.05). Seropositivity to H.pylori was significantly associated with TC (3 L*, 3 L*/1 L*) (P < 0.05, <0.01), and seropositivity to both H.pylori and SAG was significantly associated with TC (3 L*/1 L*) (P < 0.05). Multivariate analysis extracted TC (3a*, 3b*) as an independent factor associated with a differential diagnosis of EG (Odds ratio (OR) 2.66 P = 0.008, OR 2.17 P = 0.045).

CONCLUSIONS:

The tongue body color of the middle area reflects acute change of gastric mucosa, such as erosive gastritis. Tongue diagnosis would be a useful, non-invasive screening tool for EG.

PMID:26474972

Sleep apnea and nuchal ligament

J Oral Rehabil. 2015 Oct 3. doi: 10.1111/joor.12354.

Assessment of the calcification of the nuchal ligament and osteophytes of the cervical spine in obstructive sleep apnoea subjects and snorers.

Ando E¹, Shigeta Y¹, Nejima J², Yamanaka H², Hirai S¹, Ogawa T¹, Clark GT³, Enciso R⁴.
Author information

Abstract

The previous reports suggest that obstructive sleep apnoea (OSA) is related to metabolic syndrome, mineral metabolism disorders and cardiovascular disease. In addition, a possible relationship between obesity and the calcification of ligaments has been implied. However, the potential link between OSA and the calcification of ligaments has not been directly studied. In this present study, to investigate the potential link between OSA and the calcification of ligaments, we examined the prevalence of the calcification of ligaments in OSA patients and the relationship between these findings and OSA severity. Eighty consecutive patients (60 males, 20 females) diagnosed as OSA or a heavy snorer based on full-night polysomnography were retrospectively recruited from May 2006 to July 2008. Each patient underwent cephalometric imaging examination before the arrangement of an oral appliance. One calibrated observer (YS) reviewed the cephalometric images for the presence of calcification of the nuchal ligament and osteophytes of the cervical spine. The prevalence of calcification of the nuchal ligament in OSA patients and snorers was 46.3% (males: 52%, females: 30%)

There was a significant positive correlation between the severity of OSA (AHI) and the calcification of the nuchal ligament before and after adjusting for BMI. The prevalence of the calcification of the nuchal ligament in OSA subjects and snorers was higher than in previous studies with non-OSA subjects. In addition, it is suggested that the severity of OSA correlates with the presence of calcification of the nuchal ligament.

KEYWORDS: calcification; cephalograms; cervical spine; nuchal ligament; obstructive sleep apnoea

PMID:26432778

HA and TMJ

J Oral Rehabil. 2015 Oct 6. doi: 10.1111/joor.12357.

Headache attributed to masticatory myofascial pain: impact on facial pain and pressure pain threshold.

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Author information

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Abstract

There is no clear evidence on how a headache attributed to temporomandibular disorder (TMD) can hinder the improvement of facial pain and masticatory muscle pain. The aim of this study was to measure the impact of a TMD-attributed headache on masticatory myofascial (MMF) pain management. The sample was comprised of adults with MMF pain measured according to the revised research diagnostic criteria for temporomandibular disorders (RDC/TMD) and additionally diagnosed with (Group 1, n = 17) or without (Group 2, n = 20) a TMD-attributed headache. Both groups received instructions on how to implement behavioural changes and use a stabilisation appliance for 5 months. The reported facial pain intensity (visual analogue scale - VAS) and pressure pain threshold (PPT - kgf cm⁻²) of the anterior temporalis, masseter and right forearm were measured at three assessment time points. Two-way anova was applied to the data, considering a 5% significance level. All groups had a reduction in their reported facial pain intensity ($P < 0.001$). Mean and standard deviation (SD) PPT values, from 1.33 (0.54) to 1.96 (1.06) kgf cm⁻² for the anterior temporalis in Group 1 ($P = 0.016$), and from 1.27 (0.35) to 1.72 (0.60) kgf cm⁻² for the masseter in Group 2 ($P = 0.013$), had significant improvement considering baseline versus the 5th-month assessment.

However, no differences between the groups were found ($P > 0.100$). A TMD-attributed headache in patients with MMF pain does not negatively impact pain management, but does change the pattern for muscle pain improvement.

KEYWORDS: diagnosis; myofascial pain; occlusal splint; secondary headache; temporomandibular joint disorders

PMID: 26440358

Cranial nerve and migraine

Ophthalmology. 2015 Oct 9. pii: S0161-6420(15)00917-3. doi: 10.1016/j.ophtha.2015.09.003.

Migraine and Risk of Ocular Motor Cranial Nerve Palsies: A Nationwide Cohort Study.

Yang CP¹, Chen YT², Fuh JL³, Wang SJ⁴.

Author information

Abstract

PURPOSE:

To determine whether migraine is associated with an increased risk of developing ocular motor cranial nerve palsies (OMCNP).

DESIGN:

Nationwide retrospective cohort study.

PARTICIPANTS:

Medical records of patients with migraine who were entered in the National Health Insurance Research Database (NHIRD) between 2005 and 2009 were retrieved from the NHIRD in Taiwan. Two cohorts were selected: patients with migraine (n = 138 907) and propensity score-matched controls (n = 138 907).

MAIN OUTCOME MEASURES:

Cohorts were followed until the end of 2010, death, or occurrence of cranial nerve (CN)3, CN4, or CN6 palsies. A Cox proportional hazards regression model was used to calculate the hazard ratios (HRs) and 95% confidence intervals (CIs), which were used to compare to the risk of developing CN3, CN4, and CN6 palsy between cohorts.

RESULTS:

After a mean follow-up period of 3.1 years (range, 1-6 years), the migraine cohort exhibited a greater risk of developing subsequent CN3, CN4, and CN6 palsies compared with the control cohort (HR, 2.67, P < 0.001; HR, 4.23, P < 0.001; HR, 3.37; P < 0.001). This finding was maintained after excluding potential confounders during sensitivity tests. Moreover, the significant association between migraine and OMCNP remained after we adjusted for potential risk factors of microvascular ischemia. However, different migraine subtypes showed no significant differences.

CONCLUSIONS:

Migraine is an unrecognized risk factor for OMCNP development in adults. Further studies are needed to validate our findings and to delineate the exact pathophysiologic mechanisms linking migraine and OMCNP.

PMID:26460000

Quick expansion

J Indian Soc Pedod Prev Dent. 2015 Oct-Dec;33(4):341-3. doi: 10.4103/0970-4388.165713.

Treatment of skeletal class III malocclusion using face mask therapy with alternate rapid maxillary expansion and constriction (Alt-RAMEC) protocol.

Rathi AR¹, Kumari NR, Vadakkepuriyal K, Santhkumar M.
Author information

Abstract

Class III malocclusion is very common malocclusion and can be due to maxillary retrusion, mandibular prognathism, or combination. Ellis and McNamara found a combination of maxillary retrusion and mandibular protrusion to be the most common skeletal relationship (30%). The treatment should be carried out as early as possible for permitting normal growth of the skeletal bases. Reverse pull head gear combined with maxillary expansion can effectively correct skeletal Class III malocclusion due to maxillary deficiency in growing patient.

An eight-year-old female patient with chief complaint of prognathic mandible and anterior crossbite was successfully treated in duration of 5 months with facemask and expansion therapy based on Alternate Rapid Maxillary Expansion and Constriction (Alt-RAMEC) protocol.

PMID:26381639

14. HEADACHES**Adolescents and HA's**

Cephalalgia. 2015 Oct 12. pii: 0333102415610875.

Self-reported neck and shoulder pain in adolescents is associated with episodic and chronic migraine.

Landgraf MN¹, von Kries R², Heinen F³, Langhagen T⁴, Straube A⁵, Albers L².
Author information

Abstract

AIM:

The aim of this study was to verify the association between self-reported neck/shoulder pain and migraine and to compare findings of chronic and episodic migraine in adolescents.

METHODS:

In this cross-sectional study, 601 secondary-school students filled in questionnaires about headache appearance, type and frequency, neck and shoulder pain and lifestyle factors.

RESULTS:

The adjusted strength of the association between reported neck and shoulder pain and migraine (assessed in multinomial regression models) increased with the frequency of migraine: less than once a week (OR = 1.40; 95% CI = (0.85-2.30)), weekly (OR = 2.14; 95% CI = (1.42-3.24)), and at least 15 days/month (OR = 7.27; 95% CI = (3.42-15.44)).

CONCLUSION:

In adolescents the association between self-reported neck and shoulder pain and migraine is most pronounced in migraine with a high attack frequency.

KEYWORDS: Adolescents; headache; migraine frequency; neck pain; shoulder pain
PMID:26460336

17. SHOULDER GIRDLE**MT and scapula function****Effects of Stretching and Strengthening Exercises With and Without Manual Therapy on Scapular Kinematics, Function, and Pain in Individuals With Shoulder Impingement: A Randomized Controlled Trial**

Authors: Paula R. Camargo, PT, PhD¹, Francisco Alburquerque-Sendín, PT, PhD², Mariana A. Avila, PT, PhD¹, Melina N. Haik, MD¹, Amilton Vieira, MS¹, Tania F. Salvini, PT, PhD¹

Published: *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-34 doi:10.2519/jospt.2015.5939

Study Design Randomized controlled trial.

Objective To evaluate the effects of an exercise protocol, with and without manual therapy (MT), on scapular kinematics, function, pain, and mechanical sensitivity in individuals with shoulder impingement syndrome (SIS).

Background Stretching and strengthening exercises effectively decrease pain and disability in individuals with SIS. There is still conflicting evidence regarding the efficacy of adding MT to an exercise therapy regimen.

Methods Forty-six patients were assigned to 1 of 2 groups, both groups receiving a 4-week intervention. The intervention for one group consisted of stretching and strengthening exercises. The other group received the same intervention supplemented by MT targeting the shoulder and cervical spine. All outcomes were measured pre- and post-intervention at 4 weeks. Outcome measures consisted of: scapular kinematics in the scapular and sagittal planes during arm elevation, pain assessed with a visual analogue scale, mechanical sensitivity assessed with pressure pain threshold, and function as determined through the DASH questionnaire. The study is registered at www.clinicaltrials.gov (NCT02035618).

Results Independent of the intervention group, small, clinically irrelevant changes in scapular kinematics were observed post-intervention. A significant group x time interaction effect ($P=.001$) was found for scapular anterior tilt during elevation in the sagittal plane, with the exercises + manual therapy group increasing 3.0° (95%CI -1.5, 7.5) relative to baseline compared to a decrease of 0.3° (95%CI -4.2, 4.8) in the exercise only group. Pain, mechanical sensitivity, and the DASH score improved similarly for both groups by the end of the intervention period.

Conclusion Adding MT to an exercise protocol did not enhance improvements in scapular kinematics, function, and pain in individuals with SIS. The noted improvements in pain and function are not likely explained by changes in scapular kinematics.

Level of Evidence Therapy, Level 1B. *J Orthop Sports Phys Ther*, Epub 15 Oct 2015. doi:10.2519/jospt.2015.5939

Keyword: mobilization, rehabilitation, rotator cuff, sensitization, subacromial

19. GLENOHUMERAL/SHOULDER**Central sensitization in shoulder pain**

Semin Arthritis Rheum. 2015 Jun;44(6):710-6. doi: 10.1016/j.semarthrit.2014.11.002. Epub 2014 Nov 13.

The role of central sensitization in shoulder pain: A systematic literature review.

N Sanchis M1, Lluch E2, Nijs J3, Struyf F4, Kangasperko M1.

Author information**Abstract****INTRODUCTION:**

Hyperexcitability of the central nervous system has been suggested to play an important role in pain experienced by patients with unilateral shoulder pain. A systematic literature review following the PRISMA guidelines was performed to evaluate the existing evidence related to the presence of central sensitization in patients with unilateral shoulder pain of different etiologies including those with chronic subacromial impingement syndrome. Studies addressing neuropathic pain (e.g., post-stroke shoulder pain) were not considered.

METHODS:

Electronic databases PubMed, EBSCO, and Web of Science were searched to identify relevant articles using predefined keywords regarding central sensitization and shoulder pain. Articles were included till September 2013. Full-text clinical reports addressing studies of central sensitization in human adults with unilateral shoulder complaints including those diagnosed with subacromial impingement syndrome were included and screened for methodological quality by two independent reviewers.

RESULTS:

A total of 10 articles were retrieved for quality assessment and data extraction. All studies were cross-sectional (case-control) or longitudinal in nature. Different subjective and objective parameters, considered manifestations of central sensitization, were established in subjects with unilateral shoulder pain of different etiologies, including those receiving a diagnosis of subacromial impingement syndrome. Overall results suggest that, although peripheral mechanisms are involved, hypersensitivity of the central nervous system plays a role in a subgroup within the shoulder pain population.

CONCLUSIONS:

Although the majority of the literature reviewed provides emerging evidence for the presence of central sensitization in unilateral shoulder pain (including those diagnosed with subacromial impingement syndrome), our understanding of the role central sensitization plays in the shoulder pain population is still in its infancy. Future studies with high methodical quality are therefore required to investigate this further.

KEYWORDS: Central nervous system sensitization; Shoulder pain; Subacromial impingement syndrome; Systematic review

20 A. ROTATOR CUFF**Fatty infiltrate**

Am J Sports Med. 2015 Oct;43(10):2386-92. doi: 10.1177/0363546515594449. Epub 2015 Aug 18.

Prognostic Factors Affecting Rotator Cuff Healing After Arthroscopic Repair in Small to Medium-sized Tears.

Park JS¹, Park HJ¹, Kim SH², Oh JH³.

Author information

Abstract

BACKGROUND: Small and medium-sized rotator cuff tears usually have good clinical and anatomic outcomes. However, healing failure still occurs in some cases.

PURPOSE: To evaluate prognostic factors for rotator cuff healing in patients with only small to medium-sized rotator cuff tears.

STUDY DESIGN: Case-control study; Level of evidence, 3.

METHODS: Data were prospectively collected from 339 patients with small to medium-sized rotator cuff tears who underwent arthroscopic repair by a single surgeon between March 2004 and August 2012 and who underwent magnetic resonance imaging or computed tomographic arthrography at least 1 year after surgery. The mean age of the patients was 59.8 years (range, 39-80 years), and the mean follow-up time was 20.8 months (range, 12-66 months). The functional evaluation included the visual analog scale (VAS) for pain, American Shoulder and Elbow Surgeons score, Constant-Murley score, and Simple Shoulder Test.

RESULTS: Postoperative VAS for pain and functional scores improved significantly compared with preoperative values ($P < .001$). Forty-five healing failures occurred (13.3%), and fatty degeneration of the infraspinatus muscle, tear size (anteroposterior dimension), and age were significant factors affecting rotator cuff healing ($P < .001$, = .018, and = .011, respectively) in multivariate logistic regression analysis. Grade II and higher infraspinatus fatty degeneration correlated with a higher failure rate. The failure rate was also significantly higher in patients with a tear >2 cm in size (34.2%) compared with patients with a tear ≤ 2 cm (10.6%) ($P < .001$). A receiver operating characteristic curve was used to determine the predictive cut-off value for the oldest age and the largest tear size for successful healing, which were calculated as 69 years and 2 cm, respectively, with a specificity of 90%.

CONCLUSION: In small to medium-sized rotator cuff tears, grade II fatty degeneration of the infraspinatus muscle according to the Goutallier classification could be a reference point for successful healing, and anatomic outcomes might be better if repair is performed before the patient is 69 years old and the tear size exceeds 2 cm.

KEYWORDS: age; fatty degeneration of infraspinatus; prognostic factor; rotator cuff repair; small to medium-sized tears

PMID:26286879

Subscap tears

Arthroscopy. 2015 Sep 29. pii: S0749-8063(15)00660-X. doi: 10.1016/j.arthro.2015.08.006.

Poor Agreement on Classification and Treatment of Subscapularis Tendon Tears.

Smucny M¹, Shin EC¹, Zhang AL¹, Feeley BT¹, Gajju T¹, Hall SL¹, Ma CB²; MOON Shoulder Group.

Author information

Abstract

PURPOSE: To assess the inter- and intraobserver agreement for classification and management of subscapularis tendon pathology based on arthroscopy and magnetic resonance imaging (MRI).

METHODS: Twenty-two orthopaedic surgeons from the Multicenter Orthopaedic Outcomes Network (MOON) shoulder group reviewed still arthroscopic and MRI images of the subscapularis tendon from patients with a random assortment of subscapularis morphology. The surgeons were asked to classify the pathology based on 2 systems (Lafosse and Lyons) and choose whether they would repair the tendon and, if so, the method of repair (open or arthroscopic). The survey was administered 3 times to each surgeon. Inter- and intraobserver reliability between testing rounds was determined by kappa analysis.

RESULTS: Interobserver reliability on classification of tears was poor based on MRI (k = 0.18 to 0.19) and fair based on arthroscopy (k = 0.26 to 0.29). Interobserver agreement on whether surgical treatment was indicated was fair for both MRI (k = 0.28) and arthroscopy (k = 0.38), while the agreement for type of surgery was poor based on MRI (k = 0.18) and fair based on arthroscopy (k = 0.28). Interobserver agreement did not improve when both MRI and arthroscopy were provided simultaneously (k = 0.24 to 0.30). Intraobserver reliability for classification and treatment was fair to moderate for both MRI (k = 0.32 to 0.50) and arthroscopic imaging (k = 0.39 to 0.56). When considering just those patients with normal tendons, surgeon agreement improved. For all questions, the arthroscopic images had a higher level of agreement among surgeons than the MRI (P < .001).

CONCLUSIONS: Although surgeons tended to have higher reliability when presented with arthroscopic images compared with MRI, there was very little agreement on the classification and management of subscapularis tendon tears.

LEVEL OF EVIDENCE: Diagnostic Level III.

PMID:26432431

Fatty infiltration

Review Article HSS Journal ® pp 1-7

A Systematic Review of Preoperative Fatty Infiltration and Rotator Cuff Outcomes

M. Michael Khair Jason Lehman Nicholas Tsouris Lawrence V. Gulotta

Abstract**Background**

Fatty infiltration (FI) of the muscle as graded by the Goutallier classification (GC) is a well-known sequela following rotator cuff injury. The degree to which this predicts the success of rotator cuff repair is unknown.

Questions/Purposes

We conducted a systematic review to address the following questions: (1) Does the grade of FI of the rotator cuff muscles present preoperatively predict retear rates postoperatively? (2) Are amounts of preoperative FI predictive of functional outcomes following repair?

Methods

Medline, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and the Cochrane Central Register of Controlled Trials online databases were searched for all literature published between January 1966 and March 2015. Keywords were chosen to achieve a broad search category. All articles were reviewed by three of the authors, and those meeting the study inclusion criteria were selected for data abstraction.

Results

The systematic literature review yielded 11 studies reporting on a total of 925 shoulders. Rotator cuffs with moderate or significant FI preoperatively (grades 2–4) had a significantly higher retear rate than those with no or minimal FI (grades 0–1) (59 vs. 25%, $p = 0.045$). Four studies reported postoperative Constant scores and preoperative GC scores. One study found that lower GC scores were associated with higher Constant scores postoperatively, one found no association, and the data was inconclusive in the other two.

Conclusions

While lower preoperative GC scores are associated with lower rates of rotator cuff retear following repair, there is insufficient data to make conclusions on the effects of FI on functional outcomes following repair.

Keywords

massive rotator cuff tears rotator cuff tears fatty infiltration Goutallier score functional outcomes retear rates preoperative evaluation

20 B. LABRUM**MRI fails**

Arthroscopy. 2015 Oct 2. pii: S0749-8063(15)00662-3. doi: 10.1016/j.arthro.2015.08.008.

Magnetic Resonance Imaging Currently Fails to Fully Evaluate the Biceps-Labrum Complex and Bicipital Tunnel.

Taylor SA¹, Newman AM², Nguyen J², Fabricant PD², Baret NJ², Shorey M², Ramkumar P², O'Brien SJ².

Author information

Abstract

PURPOSE:

To determine the diagnostic accuracy of magnetic resonance imaging (MRI) for biceps-labrum complex (BLC) lesions, including the extra-articular bicipital tunnel.

METHODS:

A retrospective review of 277 shoulders with chronic refractory BLC symptoms that underwent arthroscopic subdeltoid transfer of the long head of the biceps tendon (LHBT) to the conjoint tendon was conducted. Intraoperative lesions were categorized as "inside" (labral tears and dynamic LHBT incarceration), "junctional" (LHBT partial tears, LHBT subluxation, and biceps chondromalacia), or "bicipital tunnel" (extra-articular bicipital tunnel scar/stenosis, loose bodies, LHBT instability, and LHBT partial tears) based on anatomic location. Attending radiologist-generated MRI reports were graded dichotomously as positive or negative for biceps and labral damage and then compared with intraoperative findings. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated for MRI with respect to intraoperative findings.

RESULTS:

With regard to inside lesions, MRI had an overall sensitivity, specificity, PPV, and NPV for labrum lesions of 77.3%, 68.2%, 57.3%, and 84.5% respectively. The sensitivity, specificity, PPV, and NPV of MRI for junctional lesions were 43.3%, 55.6%, 73.1%, and 26.0%, respectively. For the bicipital tunnel, MRI had a sensitivity, specificity, PPV, and NPV of 50.4%, 61.4%, 48.7%, and 63.0%, respectively.

CONCLUSIONS:

MRI was unreliable for ruling out BLC lesions among chronically symptomatic patients, including when the bicipital tunnel was affected.

LEVEL OF EVIDENCE: Level IV, diagnostic case-control study.

PMID:26440371

29. OA**Worsening condition****Measures of Hip Morphology are Related to Development of Worsening Radiographic Hip Osteoarthritis Over 6 to 13 Year Follow-Up: The Johnston County Osteoarthritis Project★**

Amanda E. Nelson, MD MSCR, Jamie L. Stiller, MPH, Xiaoyan A. Shi, PhD, Kirsten M. Leyland, PhD, Jordan B. Renner, MD, Todd A. Schwartz, DrPH, Nigel K. Arden, MBBS FRCP MD MSc, Joanne M. Jordan, MD MPH

Summary**Objectives**

We sought to describe the effect of alterations in hip morphology with respect to worsening hip OA in a community-based sample including African American (AA) and white men and women.

Methods

This nested case-control study defined case hips as Kellgren Lawrence grade (KLG) <3 on baseline supine pelvis radiographs and KLG ≥ 3 or THR for OA at the 1st or 2nd follow-up visit (mean 6 and 13 years, respectively); control hips had KLG <3 at both visits, with gender/race distribution similar to cases. Hip morphology was assessed using HipMorf software (Oxford, UK). Descriptive means and standard errors were obtained from generalized estimating equation (GEE) models. Sex-stratified GEE regression models (accounting for within-person correlation), adjusted for age, race, BMI, and side were then employed.

Results

A total of 120 individuals (239 hips; 71 case/168 control) were included (25% male, 26% AA, mean age 62 years, BMI 30 kg/m²). Case hips tended to have greater baseline AP alpha angles, smaller minimum joint space width (mJSW) and more frequent triangular index signs. Adjusted results among men revealed that higher AP alpha angle, Gosvig ratio, and acetabular index were positively associated with case hips; coxa profunda was negatively associated. Among women, greater AP alpha angle, smaller mJSW, protrusio acetabuli, and triangular index sign were associated with case hips.

Conclusions

We confirmed an increased risk of worsening hip OA due to baseline features of cam deformity among men and women, as well as protrusio acetabuli among women, and provide the first estimates of these measures in AAs.

Keywords: hip morphology, femoroacetabular impingement, race/sex differences

32 A. KNEE/ACL**Allograft vs autograph**

Arthroscopy. 2015 Oct 13. pii: S0749-8063(15)00652-0. doi: 10.1016/j.arthro.2015.07.027.

Autograft Versus Allograft in Anterior Cruciate Ligament Reconstruction: A Meta-analysis of Randomized Controlled Trials and Systematic Review of Overlapping Systematic Reviews.

Zeng C¹, Gao SG¹, Li H¹, Yang T¹, Luo W¹, Li YS¹, Lei GH².

Author information

Abstract

PURPOSE:

To compare autograft with allograft in anterior cruciate ligament reconstruction by conducting a meta-analysis of randomized controlled trials (RCTs) and a systematic review of overlapping systematic reviews.

METHODS:

PubMed, Embase, and the Cochrane Central Register of Controlled Trials were searched through June 28, 2014, to identify Level I and II evidence RCTs with a minimum follow-up of 2 years and systematic reviews that compared autograft with allograft in anterior cruciate ligament reconstruction. Both objective and subjective outcomes with respect to knee stability and function were meta-analyzed and summarized. The overall risk ratio (RR) or the weighted mean difference (WMD) was calculated using either a fixed- or random-effects model. The quality of evidence of the systematic review of overlapping systematic reviews was assessed using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system.

RESULTS:

Nine RCTs and 10 systematic reviews were included. In general, statistically significant differences in favor of autograft were observed for clinical failure (RR, 0.47; P = .0007), the Lachman test (RR, 1.18; P = .03), the instrumented laxity test (WMD, -0.88; P = .004), and the Tegner score (WMD, 0.36; P = .004). When subgroup analyses were conducted based on whether irradiation was used, autograft achieved better clinical outcomes than irradiated allograft in terms of the Lysholm score, clinical failure, the pivot-shift test, the Lachman test, the instrumented laxity test, and the Tegner score. In addition, there were no significant differences between the autograft and nonirradiated allograft groups for all 8 indices. The final results of this systematic review of overlapping systematic reviews were in accordance with our meta-analysis.

CONCLUSIONS:

Autograft had greater advantages than irradiated allograft with respect to function and stability, whereas there were no significant differences between autograft and nonirradiated allograft.

LEVEL OF EVIDENCE: Level IV, meta-analysis of Level II, III, and IV studies.

PMID:26474743

Allograft increased failure rate

Am J Sports Med. 2015 Oct;43(10):2501-9. doi: 10.1177/0363546515596406. Epub 2015 Aug 26.

Autograft Versus Allograft Anterior Cruciate Ligament Reconstruction: A Prospective, Randomized Clinical Study With a Minimum 10-Year Follow-up.

Bottoni CR¹, Smith EL², Shaha J³, Shaha SS⁴, Raybin SG³, Tokish JM³, Rowles DJ³.
Author information

Abstract

BACKGROUND:

The use of allografts for anterior cruciate ligament (ACL) reconstruction in young athletes is controversial. No long-term results have been published comparing tibialis posterior allografts to hamstring autografts.

PURPOSE:

To evaluate the long-term results of primary ACL reconstruction using either an allograft or autograft.

STUDY DESIGN:

Randomized controlled trial; Level of evidence, 1.

METHODS:

From June 2002 to August 2003, patients with a symptomatic ACL-deficient knee were randomized to receive either a hamstring autograft or tibialis posterior allograft. All allografts were from a single tissue bank, aseptically processed, and fresh-frozen without terminal irradiation. Graft fixation was identical in all knees. All patients followed the same postoperative rehabilitation protocol, which was blinded to the therapists. Preoperative and postoperative assessments were performed via examination and/or telephone and Internet-based questionnaire to ascertain the functional and subjective status using established knee metrics. The primary outcome measures were graft integrity, subjective knee stability, and functional status.

RESULTS:

There were 99 patients (100 knees); 86 were men, and 95% were active-duty military. Both groups were similar in demographics and preoperative activity level. The mean and median ages of both groups were identical at 29 and 26 years, respectively. Concomitant meniscal and chondral pathologic abnormalities, microfracture, and meniscal repair performed at the time of reconstruction were similar in both groups. At a minimum of 10 years (range, 120-132 months) from surgery, 96 patients (97 knees) were contacted (2 patients were deceased, and 1 was unable to be located). There were 4 (8.3%) autograft and 13 (26.5%) allograft failures that required revision reconstruction. In the remaining patients whose graft was intact, there was no difference in the mean Single Assessment Numeric Evaluation, Tegner, or International Knee Documentation Committee scores.

CONCLUSION:

At a minimum of 10 years after ACL reconstruction in a young athletic population, over 80% of all grafts were intact and had maintained stability. However, those patients who had an allograft failed at a rate over 3 times higher than those with an autograft.

KEYWORDS: ACL; allograft; anterior cruciate ligament; autograft; femoral cross-pin; hamstring; long-term survival

PMID: 26311445

Hamstring tendon regeneration

Am J Sports Med. 2015 Oct;43(10):2591-8. doi: 10.1177/0363546514562169. Epub 2014 Dec 29.

Hamstring Tendon Regeneration After Harvesting: A Systematic Review.

Suijkerbuijk MA¹, Reijman M², Lodewijks SJ², Punt J², Meuffels DE².

Author information

Abstract

BACKGROUND:

Hamstring tendons are often used as autografts for anterior cruciate ligament (ACL) reconstruction. However, no systematic review has been performed describing consequences such as hamstring tendon regeneration rate and determinants of hamstring tendon regeneration.

PURPOSE:

To summarize the current literature regarding hamstring tendon rate regeneration, the time course of regeneration, and determinants of hamstring regeneration.

STUDY DESIGN:

Systematic review.

METHODS:

A search was performed in the Embase, Medline (OvidSP), Web of Science, Cochrane, PubMed, and Google Scholar databases up to June 2014 to identify relevant articles. A study was eligible if it met the following inclusion criteria: tendons were harvested, regeneration at harvest site was assessed, population size was at least 10 human subjects, full-text article was available, and the study design was either a randomized controlled trial, prospective cohort study, retrospective cohort study, or case control study. A risk of bias assessment of the eligible articles was determined. Data describing hamstring tendon regeneration rates were pooled per time period.

RESULTS:

A total of 18 publications met the inclusion criteria. The mean regeneration rate for the semitendinosus and gracilis tendons was, in all cases, 70% or higher. More than 1 year after harvesting, 79% (median [IQR], 80 [75.5-90]) of the semitendinosus tendons and 72% (median [IQR], 80 [61-88.5]) of the gracilis tendons were regenerated. No significant differences in regeneration rate could be found considering patient sex, age, height, weight, or duration of immobilization. Results did not clearly show whether absence of regeneration disadvantages the subsequent hamstring function. Five studies measured the regeneration rate at different moments in time.

CONCLUSION:

Hamstring tendons regenerated in the majority of patients after ACL reconstruction. The majority of the hamstring tendon regeneration was found to occur between 1 month and 1 year after harvest. No significant determinants for hamstring tendon regeneration could be identified because of a lack of research. The function and strength of the regenerated hamstring remained unclear.

KEYWORDS: clinical outcome; determinants; hamstring tendon regeneration; time course
PMID:25548149

Quad strengthening

Quadriceps Strength, Muscle Activation Failure, and Patient-Reported Function at the Time of Return to Activity in Patients Following Anterior Cruciate Ligament Reconstruction: A Cross-Sectional Study

Authors: Lindsey K. Lepley, PhD, ATC¹, Riann M. Palmieri-Smith, PhD, ATC^{2,3}

Published: *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-24
doi:10.2519/jospt.2015.5753

Abstract

Study DesignCross-sectional.

ObjectivesTo determine if quadriceps activation failure (QAF) moderates the relationship between quadriceps strength and physical function in individuals post-anterior cruciate ligament (ACL) reconstruction.

Background QAF may impair the recovery of physical function post ACL reconstruction, given that QAF reduces strength, and strength is related to physical function. Evidence of this relationship has been found in individuals with knee osteoarthritis, wherein patients with lower strength and greater QAF had lower levels of physical function.

Methods Participants consisted of 52 individuals who were cleared for return to activity at an average \pm SD of 7.4 ± 1.2 months post ACL reconstruction. QAF was assessed using the superimposed burst technique and quadriceps strength was assessed using concentric isokinetic contractions (Nm/kg). Physical function was quantified using a combined variable of physical (single leg hop for distance) and self-reported function (International Knee Documentation Committee form) calculated using a principal component analysis (PCPF). Simple correlations were then performed to determine the order in which variables were entered into the regression model to evaluate if QAF moderates the relationship between quadriceps strength and physical function.

Results The combination of quadriceps strength and the interaction of strength-by-QAF predicted 30% of the variance in physical function ($R^2=0.30$, $P<.001$; $PCPF = -0.61_{\text{strength}} + 0.20_{\text{interaction}} - 1.896$); however the interaction of strength-by-QAF only accounted for 7% of the capabilities of the model ($P=.023$).

Conclusion Physical function is largely influenced by the recovery of quadriceps strength and minimally attenuated by QAF. These data suggest that QAF may affect individuals post ACL reconstruction differently, and to a lesser extent, than knee individuals with knee osteoarthritis. *J Orthop Sports Phys Ther*, Epub 15 Oct 2015. doi:10.2519/jospt.2015.5753

Keyword: ACL, central activation ratio, hop testing, IKDC, return to sports

Non-contact ruptures

Am J Sports Med. 2015 Oct;43(10):2515-21. doi: 10.1177/0363546515594446. Epub 2015 Aug 11.

Knee Kinematics During Noncontact Anterior Cruciate Ligament Injury as Determined From Bone Bruise Location.

Kim SY¹, Spritzer CE², Utturkar GM³, Toth AP³, Garrett WE³, DeFrate LE⁴.

Author information

Abstract

BACKGROUND: The motions causing noncontact anterior cruciate ligament (ACL) injury remain unclear. Tibiofemoral bone bruises are believed to be the result of joint impact near the time of ACL rupture. The locations and frequencies of these bone bruises have been reported, but there are limited data quantifying knee position and orientation near the time of injury based on these contusions.

HYPOTHESIS: Knee position and orientation near the time of noncontact ACL injury include extension and anterior tibial translation.

STUDY DESIGN: Descriptive laboratory study.

METHODS: Magnetic resonance images of 8 subjects with noncontact ACL injuries were acquired within 1 month of injury and were subsequently analyzed. All subjects exhibited bruises on both the femur and tibia in both medial and lateral compartments. The outer margins of bone and the bone bruise surfaces were outlined on each image to create a 3-dimensional model of each subject's knee in its position during magnetic resonance imaging (MRI position). Numerical optimization was used to maximize overlap of the bone bruises on the femur and tibia and to predict the position of injury. Flexion angle, valgus orientation, internal tibial rotation, and anterior tibial translation were measured in both the MRI position and the predicted position of injury. Differences in kinematics between the MRI position, which served as an unloaded reference, and the predicted position of injury were compared by use of paired t tests.

RESULTS: Flexion angle was near full extension in both the MRI position and the predicted position of injury (8° vs 12°; $P = .2$). Statistically significant increases in valgus orientation (5°; $P = .003$), internal tibial rotation (15°; $P = .003$), and anterior tibial translation (22 mm; $P < .001$) were observed in the predicted position of injury relative to the MRI position.

CONCLUSION: These results suggest that for the bone bruise pattern studied, landing on an extended knee is a high risk for ACL injury. Extension was accompanied by increased anterior tibial translation (22 mm), internal tibial rotation (15°), and valgus rotation (5°) in the predicted position of injury relative to the MRI position.

CLINICAL RELEVANCE: This study provides novel data characterizing the motions associated with ACL injury, information critical to improving strategies aimed at injury prevention.

KEYWORDS: MRI; anterior cruciate ligament; contusion; imaging; injury; mechanism; motion; valgus *PMID:26264770*

Fatiguing exercise

Effects of Neuromuscular Fatigue on Quadriceps Strength and Activation and Knee Biomechanics in Individuals Post Anterior Cruciate Ligament Reconstruction and Healthy Adults

Authors: Abbey C. Thomas, PhD, ATC¹, Lindsey K. Lepley, PhD, ATC², Edward M. Wojtys, MD^{3,4}, Scott G. McLean, PhD^{4,5}, Riann M. Palmieri-Smith, PhD, ATC^{3,4,5}

Published: *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-32 doi:10.2519/jospt.2015.5785

Study Design Laboratory based experiment using a pre/post-test design.

Objectives To determine the effects of neuromuscular fatigue on quadriceps strength and activation and sagittal and frontal plane knee biomechanics during dynamic landing following anterior cruciate ligament reconstruction (ACLR).

Background Impaired quadriceps central activation occurs post-ACLR, likely altering lower extremity biomechanics. Neuromuscular fatigue similarly reduces volitional muscle activation and impairs neuromuscular control. Upon return to full activity post-ACLR, individuals likely concurrently experience quadriceps central activation deficits and neuromuscular fatigue, though the effects of fatigue on muscle strength and activation and biomechanics post-ACLR are unknown.

Methods Seventeen individuals 7-10 months post-ACLR and 16 controls participated. Quadriceps strength and central activation ratio were recorded pre-/post-fatigue, which was induced via sets of double-leg squats. Knee biomechanics were recorded during a dynamic landing activity pre-post-fatigue.

Results Both groups demonstrated smaller knee flexion (initial contact: $P=.017$; peak: $P=.004$) and abduction (initial contact: $P=.005$; peak: $P=.009$) angles post-fatigue. The ACLR group had smaller peak knee flexion angles ($P<.001$) pre- and post-fatigue than controls. Knee flexion moment was smaller in ACLR than controls pre- ($P<.001$), but not post-fatigue ($P=.103$). Controls had smaller knee flexion moments post-fatigue ($P=.001$). Knee abduction moment was smaller in both groups post-fatigue ($P=.003$). All participants demonstrated significantly lower strength ($P<.001$) and activation ($P=.003$) post-fatigue.

Conclusion Impaired strength, central activation, and biomechanics presented post-fatigue in both groups, confirming that neuromuscular fatigue may increase non-contact ACL injury risk.

However, these changes were not exaggerated in ACLr participants, likely because they already demonstrated a stiff-legged landing strategy pre-fatigue. *J Orthop Sports Phys Ther*, Epub 15 Oct 2015. doi:10.2519/jospt.2015.5785

Keyword: ACL, muscle inhibition, quadriceps weakness, return to play

33. MENISCUS

Fatigue tears

Int Orthop. 2015 Oct 6.

"Fatigue meniscal tears": a description of the lesion and the results of arthroscopic partial meniscectomy.

Demange MK¹, Gobbi RG², Camanho GL².
Author information

Abstract

PURPOSE: The purpose of this study was to describe the clinical outcomes of partial meniscectomy in patients with "fatigue meniscal tear", which presents as a non-traumatic tear with abrupt onset of symptoms of a radial tear in the transition between the middle and posterior thirds of the meniscus.

METHODS: We prospectively followed 71 patients with "fatigue meniscal tear" (41 women and 30 men, mean age of 63 years, SD 6.9 years) recruited among 497 patients with isolated medial meniscal lesions treated between January 2006 and June 2011. Inclusion criteria were spontaneous abrupt onset knee pain, minor or no trauma, no radiographic or MRI osteoarthritis, no bone oedema, pre-operative magnetic resonance image of medial meniscus tear, and arthroscopic evaluation demonstrating radial or vertical flap tear in the body to posterior horn junction of the medial meniscus. We followed all patients for a minimum of two years and reviewed their clinical symptoms, physical exam, functional outcome, and patient satisfaction at last follow-up.

RESULTS: The average follow-up was 4.2 years, with a minimum follow-up of two years. Among the 71 patients, there were 59 (83.1 %) good or excellent results and 12 (16.9 %) poor results. These 12 patients demanded further treatment because of persistent pain, with three of the patients developing subchondral bone fracture. All patient complaints and poor outcomes could be identified in the initial six months after surgery. There was no gender difference in the subgroup analysis.

CONCLUSION: Our findings indicate that patients with "fatigue meniscal tear" benefit from arthroscopic partial meniscectomy, with only 16.9 % reporting unfavourable results.

LEVEL OF EVIDENCE: IV, Cohort study or case series.

KEYWORDS: Arthroscopy; Injuries; Knee; MeSH terms; Meniscectomy; Menisci; Meniscus tear; Osteoarthritis; Tibial

PMID:26438183

34. PATELLA

PRP helpful

Am J Sports Med. 2015 Oct;43(10):2583-90. doi: 10.1177/0363546514560726. Epub 2014 Dec 18.

Platelet-Rich Plasma in the Treatment of Patellar Tendinopathy: A Systematic Review.

Liddle AD¹, Rodríguez-Merchán EC².
Author information

Abstract

BACKGROUND:

Patellar tendinopathy (PT) is a major cause of morbidity in both high-level and recreational athletes. While there is good evidence for the effectiveness of eccentric exercise regimens in its treatment, a large proportion of patients have disease that is refractory to such treatments. This has led to the development of novel techniques, including platelet-rich plasma (PRP) injection, which aims to stimulate a normal healing response within the abnormal patellar tendon. However, little evidence exists at present to support its use.

PURPOSE:

To determine the safety and effectiveness of PRP in the treatment of PT and to quantify its effectiveness relative to other therapies for PT.

STUDY DESIGN:

Systematic review.

METHODS:

A systematic review was conducted in accordance with the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. A literature review was conducted of the Medline, EMBASE, and Cochrane databases as well as trial registries. Both single-arm and comparative studies were included. The outcomes of interest were pain (as measured by visual analog or other, comparable scoring systems), functional scores, and return to sport. Study quality and risk of bias were assessed using the methodological index for nonrandomized studies (MINORS) score and the Cochrane risk of bias tool.

RESULTS:

Eleven studies fit the inclusion criteria. Of these, 2 were randomized, controlled trials (RCTs), and 1 was a prospective, nonrandomized cohort study. The remainder were single-arm case series. All noncomparative studies demonstrated a significant improvement in pain and function after PRP injection. Complications and adverse outcomes were rare. The results of the

comparative studies were inconsistent, and superiority of PRP over control treatments could not be conclusively demonstrated.

CONCLUSION:

Platelet-rich plasma is a safe and promising therapy in the treatment of recalcitrant PT. However, its superiority over other treatments such as physical therapy remains unproven. Further RCTs are required to determine the relative effectiveness of the many available treatments for PT and to determine the subgroups of patients who stand to gain the most from the use of these therapies.

KEYWORDS: patellar tendon; platelet-rich plasma; tendinopathy; treatment

PMID: 25524323

35. KNEE/TOTAL

Results

Knee Surg Sports Traumatol Arthrosc. 2015 Oct 6.

Severe arthritis predicts greater improvements in function following total knee arthroplasty.

Stone OD¹, Duckworth AD², Curran DP³, Ballantyne JA³, Brenkel IJ³.

Author information

Abstract

PURPOSE:

Although excellent outcomes are routinely reported following total knee replacement, up to 20 % of patients remain dissatisfied. The aim of this study was to determine whether pre-operative radiographic classification was associated with functional outcomes following surgery.

METHODS:

A retrospective review of a prospective arthroplasty database identified 256 patients that fulfilled the inclusion criteria over an 18-month period. Baseline demographic data on all patients were collected prospectively. All pre-operative radiographs were assessed using the Kellgren and Lawrence (K&L) classification system. Patients were prospectively assessed using the American Knee Society Score pre-operatively and at 1, 3 and 5 years post-surgery.

RESULTS:

An association was found between the pre-operative radiographic severity of arthritis and the pre-operative American Knee Society Knee (AKSK) scores, with worsening radiographic grade corresponding to worsening AKSK scores ($p = 0.020$). There was an association between K&L classification and improvement in AKSK scores from pre-operative to 1 year ($p = 0.003$) and 3 years ($p = 0.04$), with K&L grades 3 and 4 demonstrating the most significant improvements. On multivariate regression analysis, K&L classification was the only significant predictor of improvement in AKSK at 1 year ($p = 0.009$). No correlation was found between K&L grade and the American Knee Society Functional Scores at any stage.

CONCLUSIONS:

The results of this study may help to improve satisfaction rates in total knee replacement by targeting treatment. Patients can be counselled that although radiographic severity of arthritic changes can predict knee-specific functional improvement, the extent of their global functional improvement cannot.

LEVEL OF EVIDENCE: IV.

KEYWORDS: Arthritis; Arthroplasty; Grade; Knee; Outcomes

PMID: 26441252

36. KNEE/EXERCISE

VMO/VLO

Evidence-Based Complementary and Alternative Medicine
Volume 2015 (2015), Article ID 740315, 8 pages
<http://dx.doi.org/10.1155/2015/740315>

Research Article

Muscle Activation of Vastus Medialis Oblique and Vastus Lateralis in Sling-Based Exercises in Patients with Patellofemoral Pain Syndrome: A Cross-Over Study

Wen-Dien Chang,¹ Wei-Syuan Huang,¹ and Ping-Tung Lai²

Abstract

Objectives. To examine what changes are caused in the activity of the vastus medialis oblique (VMO) and vastus lateralis (VL) at the time of sling-based exercises in patients with patellofemoral pain syndrome (PFPS) and compare the muscular activations in patients with PFPS among the sling-based exercises.

Methods. This was a cross-over study. Sling-based open and closed kinetic knee extension and hip adduction exercises were designed for PFPS, and electromyography was applied to record maximal voluntary contraction during the exercises. The VMO and VL activations and VMO : VL ratios for the three exercises were analyzed and compared.

Results. Thirty male (age = 21.19 ± 0.68 y) and 30 female (age = 21.12 ± 0.74 y) patients with PFPS were recruited. VMO activations during the sling-based open and closed kinetic knee extension exercises were significantly higher (and) than those during hip adduction exercises and VMO : VL ratio for the sling-based closed kinetic knee extension and hip adduction exercises approximated to 1.

Conclusions. The sling-based closed kinetic knee extension exercise produced the highest VMO activation. It also had an appropriate VMO : VL ratio similar to sling-based hip adduction exercise and had beneficial effects on PFPS.

37. OSTEOARTHRITIS/KNEE

Exercise helps

Clin Rehabil. 2015 Oct 15. pii: 0269215515610039.

The effects of resistance exercise in patients with knee osteoarthritis: A systematic review and meta-analysis.

Li Y¹, Su Y², Chen S¹, Zhang Y¹, Zhang Z¹, Liu C¹, Lu M¹, Liu F¹, Li S¹, He Z¹, Wang Y¹, Sheng L¹, Wang W¹, Zhan Z¹, Wang X¹, Zheng N¹.

Author information

Abstract

OBJECTIVE:

To analyze the effectiveness of resistance exercise in the treatment of knee osteoarthritis on pain, stiffness, and physical function.

DESIGN:

Systematic review and meta-analysis of randomized controlled trials.

DATA SOURCES:

PubMed, Embase, Cochrane Central Register of Controlled Trials, the Web of Science, and Chinese Biomedical Literature Database were searched from the date of inception to August 2015.

METHODS:

Trials comparing effects of resistance exercise intervention with either non-intervention or psycho-educational intervention were selected by two reviewers independently. The risk of bias was assessed and studies with similar outcomes were pooled using a fixed or random effects model.

RESULTS:

Data from 17 randomized clinical trials including 1705 patients were integrated. The main source of methodological bias in the selected studies was lack of double blinding. The meta-analysis results suggested that resistance exercise training relieved pain (standard mean difference [SMD]: -0.43; 95% confidence interval [CI]: -0.57 to -0.29; $P < 0.001$), alleviated stiffness (SMD: -0.31; 95% CI: -0.56 to -0.05; $P = 0.02$), and improved physical function (SMD -0.53; 95% CI: -0.70 to -0.37; $P < 0.001$).

CONCLUSION:

Resistance exercise is beneficial in terms of reducing pain, alleviating stiffness, and improving physical function in patients with knee osteoarthritis.

KEYWORDS: Resistance exercise; knee osteoarthritis; meta-analysis; pain

PMID:26471972

PRP helps

Arthroscopy. 2015 Sep 29. pii: S0749-8063(15)00659-3. doi: 10.1016/j.arthro.2015.08.005.

Efficacy of Intra-articular Platelet-Rich Plasma Injections in Knee Osteoarthritis: A Systematic Review.

Meheux CJ¹, McCulloch PC¹, Lintner DM¹, Varner KE¹, Harris JD².

Author information

Abstract

PURPOSE:

To determine (1) whether platelet-rich plasma (PRP) injection significantly improves validated patient-reported outcomes in patients with symptomatic knee osteoarthritis (OA) at 6 and 12 months postinjection, (2) differences in outcomes between PRP and corticosteroid injections or viscosupplementation or placebo injections at 6 and 12 months postinjection, and (3) similarities and differences in outcomes based on the PRP formulations used in the analyzed studies.

METHODS:

PubMed, Cochrane Central Register of Controlled Trials, SCOPUS, and Sport Discus were searched for English-language, level I evidence, human in vivo studies on the treatment of symptomatic knee OA with intra-articular PRP compared with other options, with a minimum of 6 months of follow-up. A quality assessment of all articles was performed using the Modified Coleman Methodology Score (average, 83.3/100), and outcomes were analyzed using 2-proportion z-tests.

RESULTS:

Six articles (739 patients, 817 knees, 39% males, mean age of 59.9 years, with 38 weeks average follow-up) were analyzed. All studies met minimal clinical important difference criteria and showed significant improvements in statistical and clinical outcomes, including pain, physical function, and stiffness, with PRP. All but one study showed significant differences in clinical outcomes between PRP and hyaluronic acid (HA) or PRP and placebo in pain and function. Average pretreatment Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores were 52.36 and 52.05 for the PRP and HA groups, respectively (P = .420). Mean post-treatment WOMAC scores for PRP were significantly better than for HA at 3 to 6 months (28.5 and 43.4, respectively; P = .0008) and at 6 to 12 months (22.8 and 38.1, respectively; P = .0062). None of the included studies used corticosteroids.

CONCLUSIONS:

In patients with symptomatic knee OA, PRP injection results in significant clinical improvements up to 12 months postinjection. Clinical outcomes and WOMAC scores are significantly better after PRP versus HA at 3 to 12 months postinjection. There is limited evidence for comparing leukocyte-rich versus leukocyte-poor PRP or PRP versus steroids in this study.

LEVEL OF EVIDENCE:

Level I, systematic review of Level I studies.

PMID: 26432430

40. ANKLE SPRAINS AND INSTABILITY**Repair of lateral lig. Return to sport**

Knee Surg Sports Traumatol Arthrosc. 2015 Oct 5.

Return to sport following acute lateral ligament repair of the ankle in professional athletes.

White WJ¹, McCollum GA², Calder JD^{3,4}.

Author information

Abstract

PURPOSE:

Recent literature supports early reconstruction of severe acute lateral ligament injuries in professional athletes, suggesting earlier rehabilitation and reduced recurrent instability incidence. Not previously reported, predicting the time to return to training and play is important to both athlete and club. We evaluate the effectiveness and complications of lateral ligament reconstruction in professional athletes. We aim to estimate the time to return to training and sports in both isolated injuries and patients with additional injuries.

METHODS:

A consecutive series of 42 athletes underwent modified Broström repair for clinically and radiologically confirmed acute grade III lateral ligament injury. Of 42, 30 had isolated complete rupture of ATFL and CFL. Of 42, 12 had additional injuries (osteochondral lesions, deltoid ligament injuries). All patients received minimum of 2 years post-operative assessment.

RESULTS:

The median return to training and sports for isolated injuries was 63 days (49-110) and 77 days (56-127), respectively. However, for concomitant injury results were 86 days (63-152) and 105 days (82-178). This delay was significant ($p < 0.001$). Despite no difference in pre- and post-op VAS scores between the groups, those with combined injuries had significantly lower FAOS pain and symptoms sub-scores post-operatively ($p = 0.027$, $p < 0.001$). Two superficial infections responded to oral antibiotics. No patient developed recurrent instability. All returned to their pre-injury level of professional sports.

CONCLUSION:

Lateral ligament reconstruction is a safe and effective treatment for acute severe ruptures providing a stable ankle and expected return to sports at approximately 10 weeks. Despite return

to the same level of competition, club and player should be aware that associated injuries may delay return and symptoms may continue. These results may act as a guide to predict the expected time to return to training and to sport after surgical repair of acute injuries and also the influence of associated injuries in prolonging rehabilitation.

LEVEL OF EVIDENCE:

III.

KEYWORDS: Acute; Ankle; Athlete; Broström; Lateral; Ligament; Professional; Repair
PMID: 26438247

43. HALLUX VALGUS

Lateral Sesamoid position

J Foot Ankle Surg. 2015 Sep 30. pii: S1067-2516(15)00413-5. doi: 10.1053/j.jfas.2015.08.023.

Lateral Sesamoid Position Relative to the Second Metatarsal in Feet With and Without Hallux Valgus: A Prospective Study.

Geng X¹, Zhang C², Ma X³, Wang X⁴, Huang J², Xu J¹, Wang C¹.
Author information

Abstract

We sought to determine whether hallux valgus displaces the sesamoid bones laterally away from a stationary first metatarsal or whether the first metatarsal head is displaced medially from the stationary sesamoids, which remain in position relative to the rest of the forefoot. We reviewed weightbearing radiographs in the dorsal plantar view of 128 consecutive patients (149 feet) seen over 2 months in 2014. Of these, 82 feet (55%) had a hallux valgus angle of $>15^\circ$ (hallux valgus group) and 67 feet (45%) had an angle of no more than 15° (control group). We measured the absolute distances from the center of the lateral sesamoid and the first metatarsal head to the long axis of the second metatarsal. Next, the relative distances, defined as the ratio of these 2 absolute distances to the length of the second metatarsal, were calculated to adjust for foot size. Both the absolute and the relative distances from the center of the first metatarsal head to the second metatarsal differed significantly between the 2 groups and correlated positively with the hallux valgus angle and first intermetatarsal angle.

However, neither the absolute nor the relative distance to the lateral sesamoid bone differed significantly between the groups, nor did they correlate with either of the 2 angles. Thus, despite medial shifting of the first metatarsal in hallux valgus, the lateral sesamoid retains its relationship to the second metatarsal in transverse plane. Its apparent lateral movement is a radiographic misinterpretation. Awareness of this misinterpretation should improve the success of corrective surgery.

KEYWORDS: dorsal plantar radiographs; hallux valgus; second metatarsal; sesamoid subluxation
PMID:26433869

44. RHUMATOID ARTHRITIS

AS and breast feeding

Ann Rheum Dis. 2015 Oct 12. pii: annrheumdis-2015-208187. doi: 10.1136/annrheumdis-2015-208187.

Patients with ankylosing spondylitis have been breast fed less often than healthy controls: a case-control retrospective study.

Montoya J¹, Matta NB¹, Suchon P², Guzian MC¹, Lambert NC³, Mattei JP¹, Guis S¹, Breban M⁴, Roudier J⁵, Balandraud N⁵.

Author information

Abstract

OBJECTIVE:

Ankylosing spondylitis (AS) is a chronic inflammatory disease affecting the spine and pelvis of young adults. On the HLA-B27 genetic background, the occurrence of AS is influenced by the intestinal microbiota. The goal of our study was to test whether breast feeding, which influences microbiota, can prevent the development of AS.

METHODS:

First, 203 patients with HLA-B27-positive AS fulfilling the modified New York criteria were recruited in the Department of Rheumatology, Ste Marguerite hospital in Marseilles. A total of 293 healthy siblings were also recruited to make up a control group within the same families. Second, 280 healthy controls, and 100 patients with rheumatoid arthritis and their siblings were recruited. The data collected were age, gender, number of brothers and sisters, age at disease onset, type and duration of feeding (breast or bottle).

RESULTS:

Patients with AS had been breast fed less often than healthy controls. In families where children were breast fed, the patients with AS were less often breast fed than their healthy siblings (57% vs 72%), giving an OR for AS onset of 0.53 (95% CI (0.36 to 0.77), p value=0.0009). Breast feeding reduced familial prevalence of AS. The frequency of breast feeding was similar in the AS siblings and in the 280 unrelated controls. However, patients with AS were less often breast fed compared with the 280 unrelated controls (OR 0.6, 95% CI (0.42 to 0.89), p<0.01).

CONCLUSIONS:

Our study suggests a breastfeeding-induced protective effect on the occurrence of AS. To our knowledge, this is the first study of breastfeeding history in patients with AS.

KEYWORDS: Ankylosing Spondylitis; Epidemiology; Outcomes research
PMID:26458738

45 A. MANUAL THERAPY LUMBAR & GENERAL**Scoliosis**

Scoliosis. 2015 Oct 5;10:29. doi: 10.1186/s13013-015-0053-8. eCollection 2015.

Patient-reported side effects immediately after chiropractic scoliosis treatment: a cross-sectional survey utilizing a practice-based research network.

Woggon AJ¹, Woggon DA¹.
Author information

Abstract

BACKGROUND:

Concern exists regarding the potential for chiropractic treatment to cause adverse effects in individuals with scoliosis. The aim of this paper is to present the self-reported responses of 189 scoliosis patients over 3198 unique visits, collected over one calendar year from nine chiropractic clinics, regarding how they felt and the side effects they experienced immediately after chiropractic treatment.

METHODS:

Thirty six private chiropractic clinics specializing in the treatment of scoliosis were asked to participate in a prospective study regarding the side-effects of the chiropractic treatment of scoliosis; 9 agreed to participate. A response form was provided to each scoliosis patient at the end of their clinic visit, and consisted of two questions: "How do you feel after your treatment today?" and "Did you experience any side-effects as a result of your treatment today?"

RESULTS:

One hundred eighty nine informed consent forms were collected and 3198 response forms were collected, suggesting an average of 17 visits per patient. Patients reported feeling worse post-treatment after 5.0 % of the visits. The incidence of side-effects was 29.7 %. Muscle soreness accounted for 35.2 % of all side effects. 99.9 % of all side effects were classified as mild. Six moderate side-effects (sprains/strains) were reported out of 3,198 visits. There were no reported cases of severe side effects.

CONCLUSION:

Mild side effects were common, although the frequency was slightly lower than the average for chiropractic interventions. The rate of moderate side effects reported was one per 533 visits involving the care of 189 scoliosis patients surveyed from 9 chiropractic offices over a timeframe of one calendar year. No serious adverse events occurred that required medical attention, hospital stays, or surgical intervention. Based upon this preliminary data, side effects reported by scoliosis patients immediately after chiropractic treatment appear to be relatively common but generally benign.

PMID:26445594

48 A. STM**STM for scar tissue****Soft Tissue Mobilization to Resolve Chronic Pain and Dysfunction Associated With Post-Operative Abdominal and Pelvic Adhesions: A Case Report**

Authors: Yui Y. Wong, PT, DPT, OCS¹, Ryan W. Smith, PT, DPT², Shane Koppenhaver, PT, PhD, OCS, FAAOMPT³

Published: *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-29 doi:10.2519/jospt.2015.5766

Study Design Case report.

Background Common complications from abdominal and pelvic surgery include adhesions and chronic pain. Laparoscopic adhesiolysis is sometimes used with the intent of reducing adhesions and related pain. Physical therapy interventions, such as soft tissue mobilization (STM) may be used for this condition, but evidence to support its effectiveness is lacking.

Case Description A 28-year-old female with a history of 5 abdominal/pelvic surgeries presented with right-sided lower abdominal and anterior hip pain present since laparoscopic appendectomy with a right ovarian cystectomy surgery performed 1 year earlier. She was an active duty member in the United States Navy, and due to pain and weakness, was unable to perform required curl-ups for her fitness test. She had been previously treated both surgically with laparoscopy adhesiolysis and non-surgically with physical therapy consisting of stretching and strengthening exercises; however, her pain and function did not improve. She was again evaluated and treated by physical therapy; and based on her examination findings, STM was used to address her pain and dysfunction presumably related to intra-abdominal adhesions.

Outcomes Following 5 sessions of physical therapy, over a 3 week period, which included STM and therapeutic exercises, followed by 5 additional sessions, over a 4 week period, which focused on therapeutic exercises, the patient reported substantially decreased pain, improved function, and

a full return to previous level of activity, including unrestricted physical training in a military setting.

Discussion The outcomes on this patient suggest STM as a conservative treatment option for pain and dysfunction presumed related to intra-abdominal adhesions from abdominal/pelvic surgeries. Higher level of evidence studies, including potential comparison between STM to traditional laparoscopic adhesiolysis are needed to further determine benefits of non-surgical care for this condition.

Level of Evidence Therapy, level 4. J Orthop Sports Phys Ther, Epub 15 Oct 2015.
doi:10.2519/jospt.2015.5766

Keyword: abdomen, adhesiolysis, manual therapy, postoperative scar

48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE

Changes in the brain with Acupuncture

Repeated verum but not placebo acupuncture normalizes connectivity in brain regions dysregulated in chronic pain

Natalia Egorova, Randy L. Gollub, Jian Kong

Highlights

- Increased PAG–hippocampus connectivity correlates with worse pain in knee osteoarthritis.
- Reduced PAG–medial frontal connectivity is associated with worse pain during sport.
- Verum acupuncture decreases PAG–hippocampus connectivity improving pain scores.
- Sham acupuncture decreases PAG–medial frontal connectivity with no pain improvement.

Abstract

Acupuncture, an ancient East Asian therapy, is aimed at rectifying the imbalance within the body caused by disease. Studies evaluating the efficacy of acupuncture with neuroimaging tend to concentrate on brain regions within the pain matrix, associated with acute pain. We, however, focused on the effect of repeated acupuncture treatment specifically on brain regions known to support functions dysregulated in chronic pain disorders. Transition to chronic pain is associated with increased attention to pain, emotional rumination, nociceptive memory and avoidance learning, resulting in brain connectivity changes, specifically affecting the periaqueductal gray (PAG), medial frontal cortex (MFC) and bilateral hippocampus (Hpc).

We demonstrate that the PAG–MFC and PAG–Hpc connectivity in patients with chronic pain due to knee osteoarthritis indeed correlates with clinical severity scores and further show that verum acupuncture-induced improvement in pain scores (compared to sham) is related to the modulation of PAG–MFC and PAG–Hpc connectivity in the predicted direction. This study shows that repeated verum acupuncture might act by restoring the balance in the connectivity of the key pain brain regions, altering pain-related attention and memory.

Keywords: Acupuncture; Resting state fMRI; Chronic pain; Osteoarthritis

50 A. MOTOR CONTROL

Lumbopelvic motor control

J Sports Sci. 2015 Sep 25:1-9.

Lumbopelvic motor control and low back pain in elite soccer players: a cross-sectional study.

Grosdent S1,2, Demoulin C1,2, Rodriguez de La Cruz C3, Giop R1, Tomasella M1,2, Crielaard JM1,2, Vanderthommen M1,2.

Author information

Abstract

This study aimed to investigate the relationship between the history of low back pain and quality of lumbopelvic motor control in soccer players. Forty-three male elite soccer players (mean age, 18.2 ± 1.4 years) filled in questionnaires related to low back pain and attended a session to assess lumbopelvic motor control by means of five tests (the bent knee fall out test, the knee lift abdominal test, the sitting knee extension test, the waiter's bow and the transversus abdominis test). A physiotherapist, blinded to the medical history of the participants, scored (0 = failed, 1 = correct) the performance of the players for each of the tests resulting in a lumbopelvic motor control score ranging from 0 to 5. Forty-seven per cent of the soccer players reported a disabling low back pain episode lasting at least two consecutive days in the previous year. These players scored worse lumbopelvic motor control than players without a history of low back pain (lumbopelvic motor control score of 1.8 vs. 3.3, $P < 0.01$). The between-groups difference was particularly marked for the bent knee fall out test, the knee lift abdominal test and the transversus abdominis test ($P < 0.01$).

In conclusion, most soccer players with a history of low back pain had an altered lumbopelvic motor control. Further research should examine whether lumbopelvic motor control is etiologically involved in low back pain episodes in soccer players.

KEYWORDS:

Soccer player; low back pain; lumbopelvic; motor control impairment

51. CFS/BET

Ideal sitting?

Claus, A. P., et al. (2009).

Is 'ideal' sitting posture real? Measurement of spinal curves in four sitting postures.

Man Ther **14**(4): 404-408.

There is a lack of quantitative evidence for spinal postures that are advocated as 'ideal' in clinical ergonomics for sitting.

This study quantified surface spinal curves and examined whether subjects could imitate clinically 'ideal' directions of spinal curve at thoraco-lumbar and lumbar regions: (i) flat - at both regions (ii) long lordosis - lordotic at both regions (iii) short lordosis - thoracic kyphosis and lumbar lordosis. Ten healthy male subjects had 3-D motion sensors adhered to the skin so that sagittal spinal curves were represented by angles at thoracic (lines between T1-T5 and T5-T10), thoraco-lumbar (T5-T10 and T10-L3) and lumbar regions (T10-L3 and L3-S2). Subjects attempted to imitate pictures of spinal curves for the flat, long lordosis, short lordosis and a slumped posture, and were then given feedback/manual facilitation to achieve the postures. Repeated measures analysis of variance was used to compare spinal angles between posture and facilitation conditions.

Results show that although subjects imitated postures with the same curve direction at thoraco-lumbar and lumbar regions (slumped, flat or long lordosis), they required feedback/manual facilitation to differentiate the regional curves for the short lordosis posture. Further study is needed to determine whether the clinically proposed 'ideal' postures provide clinical advantages.

Sitting and standing disc pressure

Claus, A., et al. (2008).

Sitting versus standing: does the intradiscal pressure cause disc degeneration or low back pain?

J Electromyogr Kinesiol **18**(4): 550-558.

Studies of lumbar intradiscal pressure (IDP) in standing and upright sitting have mostly reported higher pressures in sitting.

It was assumed clinically that flexion of the lumbar spine in sitting relative to standing, caused higher IDP, disc degeneration or rupture, and low back pain. IDP indicates axial compressive load upon a non-degenerate disc, but provides little or no indication of shear, axial rotation or bending.

This review is presented in two main parts. First, in vivo IDP data in standing and upright sitting for non-degenerate discs are comprehensively reviewed. As methodology, results and interpretations varied between IDP studies, in vivo studies measuring spinal shrinkage and spinal internal-fixator loads to infer axial compressive load to the discs are also reviewed. When data are considered together, it is clear that IDP is often similar in standing and sitting.

Secondly, clinical assumptions related to IDP in sitting are considered in light of basic and epidemiologic studies. Current studies indicate that IDP in sitting is unlikely to pose a threat to non-degenerate discs, and sitting is no worse than standing for disc degeneration or low back pain incidence. If sitting is a greater threat for development of low back pain than standing, the mechanism is unlikely to be raised IDP.

Sitting and psoas and QL

Park, R. J., et al. (2013).

Changes in regional activity of the psoas major and quadratus lumborum with voluntary trunk and hip tasks and different spinal curvatures in sitting.

J Orthop Sports Phys Ther **43**(2): 74-82.

STUDY DESIGN: Cross-sectional controlled laboratory study.

OBJECTIVES: To investigate the function of discrete regions of psoas major (PM) and quadratus lumborum (QL) with changes in spinal curvature and hip position.

BACKGROUND: Anatomically discrete regions of PM and QL may have differential function on the lumbar spine, based on anatomical and biomechanical differences in their moment arms between fascicles within each muscle.

METHODS: Fine-wire electrodes were inserted with ultrasound guidance into PM fascicles arising from the transverse process (PM-t) and vertebral body (PM-v) and anterior (QL-a) and posterior (QL-p) layers of QL. Recordings were made on 9 healthy participants, who performed 7 tasks with maximal voluntary efforts and adopted 3 sitting postures that involved different spinal curvatures and hip angles.

RESULTS: Activity of PM-t was greater during trunk extension than flexion, whereas activity of PM-v was greater during hip flexion than trunk efforts. Activity of QL-p was greater during trunk extension and lateral flexion, whereas QL-a showed greater activity during lateral flexion. During sitting tasks, PM-t was more active when sitting with a short lordosis than a flat (less extended) lumbar spine posture, whereas PM-v was similarly active in both sitting postures.

CONCLUSION: Activity of PM-t was more affected by changes in position of the lumbar spine than the hip, whereas PM-v was more actively involved in the movement of the hip rather than that of the lumbar spine. Moreover, from its anatomy, PM-t has a combined potential to extend/lordose the lumbar spine and flex the hip, at least in a flexed-hip position.

LBP and sitting

Park, R. J., et al. (2013).

Recruitment of discrete regions of the psoas major and quadratus lumborum muscles is changed in specific sitting postures in individuals with recurrent low back pain.

J Orthop Sports Phys Ther **43**(11): 833-840.

STUDY DESIGN: Cross-sectional controlled laboratory study.

OBJECTIVES: To investigate potential changes in the function of discrete regions of the psoas major (PM) and quadratus lumborum (QL) with changes in spinal curvatures and hip positions in sitting, in people with recurrent low back pain (LBP).

BACKGROUND: Although the PM and QL contribute to control of spinal curvature in sitting, whether activity of these muscles is changed in individuals with LBP is unknown.

METHODS: Ten volunteers with recurrent LBP (pain free at the time of testing) and 9 pain-free individuals in a comparison group participated. Participants with LBP were grouped into those with high and low erector spinae (ES) electromyographic (EMG) signal amplitude, recorded when sitting with a lumbar lordosis. Data were recorded as participants assumed 3 sitting postures. Fine-wire electrodes were inserted with ultrasound guidance into fascicles of the PM arising from the transverse process and vertebral body, and the anterior and posterior layers of the QL.

RESULTS: When data from those with recurrent LBP were analyzed as 1 group, PM and QL EMG signal amplitudes did not differ between groups in any of the sitting postures. However, when subgrouped, those with low ES EMG had greater EMG signal amplitude of the PM vertebral body and QL posterior layer in flat posture and greater EMG signal amplitude of the QL posterior layer in short lordotic posture, compared to those in the pain-free group. For the group with high ES EMG, the PM transverse process and PM vertebral body EMG was less than that of the other LBP group in short lordotic posture.

CONCLUSION: The findings suggest a redistribution of activity between muscles that have a potential extensor moment in individuals with LBP. The modification of EMG of discrete fascicles of the PM and QL was related to changes in ES EMG signal amplitude recorded in sitting.

Body mechanics of pushing

Varcin, L., et al. (2015).

Manual handling: differences in perceived effort, success rate and kinematics between three different pushing techniques.

Ergonomics **58**(2): 268-277.

This study examined the perceived effort, success rates and kinematics for three push strategies in a simulated lateral patient transfer (horizontal slide).

Thirteen healthy subjects (four males) completed three repetition pushing loads of 6, 10 and 14 kg in random order; with a spontaneous push strategy, then with a straight-back bent-knees (squat) strategy and the preparatory pelvic movement ('rockback') strategy in random order. Perceived effort and kinematic parameters measured at the onset of movement and at maximum push excursion were compared between strategies and between loads with repeated measures ANOVA. The spontaneous and 'rockback' strategies achieved the pushing task with less perceived effort across all loads than the squat push ($P < 0.001$). Only 3/13 participants were successful on all attempts at pushing the 14 kg load using a squat strategy, which contrasted with 12/13 participants when the spontaneous strategy or the 'rockback' strategy was used. Forward movement of the pelvis and forward trunk inclination may be positively associated with lower perceived effort in the push task.

Practitioner Summary: In a manual-handling task that simulated a lateral patient transfer (horizontal slide), perceived effort and success rates of three push strategies were compared. A straight-back bent-knees push (squat) strategy demonstrated greater perceived effort and lower success rates than a spontaneous push strategy, or a push strategy with preparatory 'rockback' pelvic movement.

52. EXERCISE

Exercise enhances white matter

Resistance Training and White Matter Lesion Progression in Older Women: Exploratory Analysis of a 12-Month Randomized Controlled Trial.

Bolanzadeh N, et al. J Am Geriatr Soc. 2015.

Abstract

OBJECTIVES: To assess whether resistance training (RT) slows the progression of white matter lesions (WMLs) in older women.

DESIGN: Secondary analysis of a 52-week randomized controlled trial of RT, the Brain Power Study.

SETTING: Community center and research center.

PARTICIPANTS: Of 155 community-dwelling women aged 65 to 75 enrolled in the Brain Power Study, 54 who had evidence of WMLs on magnetic resonance imaging (MRI) at baseline were included in this secondary analysis.

INTERVENTION: Participants were randomized to once-weekly RT (1× RT), twice-weekly RT (2× RT), or twice-weekly balance and tone (BAT). Assessors were blinded to participant assignments.

MEASUREMENTS: WML volume was measured using MRI at baseline and trial completion.

RESULTS: At trial completion, the 2× RT group had significantly lower WML volume than the BAT group ($P = .03$). There was no significant difference between the BAT group and the 1× RT group at trial completion ($P = .77$). Among participants in the two RT groups, reduced WML progression over 12 months was significantly associated with maintenance of gait speed (correlation coefficient (r) = -0.31, $P = .049$) but not with executive functions ($r = 0.30$; $P = .06$).

CONCLUSION: Engaging in progressive RT may reduce WML progression.

PMID 26456233

54. POSTURE

Balanced sitting

Claus, A. P., et al. (2009).

Different ways to balance the spine: subtle changes in sagittal spinal curves affect regional muscle activity.

Spine (Phila Pa 1976) **34**(6): E208-214.

STUDY DESIGN: Exploratory study of regional muscle activity in different postures.

OBJECTIVE: To detail the relationship between spinal curves and regional muscle activity.

SUMMARY OF BACKGROUND DATA: Sagittal balanced spinal posture (C7 above S1 in the sagittal plane) is a goal for spinal surgery and conservative ergonomics. Three combinations of thoracolumbar and lumbar spinal curves can be considered sagittal balanced postures: (i) flat-at both regions, (ii) long lordosis-lordotic at both regions, and (iii) short lordosis-thoracic kyphosis and lumbar lordosis. This study compares regional muscle activity between these 3 sagittal balanced postures in sitting, as well as a slump posture.

METHODS: Fine-wire electromyography (EMG) electrodes were inserted into the lumbar multifidus (deep and superficial), iliocostalis (lateral and medial), longissimus thoracis, and transversus abdominis in 14 healthy male volunteers. Fine-wire or surface EMG electrodes were also used to record activity of the obliquus internus, obliquus externus, and rectus abdominis muscles. Root mean square EMG amplitude in the flat, long lordosis, short lordosis, and slump sitting postures were normalized to maximal voluntary contraction, and also to the peak activity across the sitting postures. Muscle activity was compared between postures with a linear mixed model analysis. RESULTS: Of the extensor muscles, it was most notable that activity of the deep and superficial fibers of lumbar multifidus increased incrementally in the 3 sagittal balanced postures; flat, long lordosis, and short lordosis ($P < 0.05$). Of the abdominal muscles, obliquus internus was more active in short lordosis than the other postures ($P < 0.05$). Comparing the

sagittal balanced postures, the flat posture showed the least muscle activity (similar to the slump posture at most muscles examined).

CONCLUSION: Discrete combinations of muscle activity supported the 3 different sagittal balanced postures in sitting, providing new detail for surgeons, researchers, and therapists to distinguish between different sagittal balanced postures.

55. SCOLIOSIS

Changes in

Eur Spine J. 2015 Sep 30.

Epidemiology and associated radiographic spinopelvic parameters of symptomatic degenerative lumbar scoliosis: are radiographic spinopelvic parameters associated with the presence of symptoms or decreased quality of life in degenerative lumbar scoliosis?

Iizuka Y¹, Iizuka H², Mieda T², Tajika T², Yamamoto A², Takagishi K².
Author information

Abstract

OBJECTIVES:

To investigate the epidemiology of radiographic degenerative lumbar scoliosis (DLS) and symptomatic DLS and clarify the impact of radiographic spinopelvic parameters on the presence of symptoms and quality of life (QOL) in DLS subjects.

METHODS:

We obtained the age, gender, screening for chronic low back pain (CLBP) and lumbar spinal stenosis (LSS), QOL assessments and X-rays of the thoracolumbar spine from 254 patients from the general population for this study. The prevalence of DLS and symptomatic DLS were estimated and factors associated with symptoms, and the QOL in the DLS subjects was analysed.

RESULTS:

The prevalence of radiographic and symptomatic DLS was 19.2 and 7.8 %, respectively. A female gender ($p = 0.018$) and decreased sacral slope ($p = 0.025$) were associated with the presence of CLBP in the DLS subjects. A higher age was also associated with the presence of LSS in these subjects ($p = 0.007$), whereas the Cobb angle was found to be close the limit for significance ($p = 0.063$). The sacro-femoral-pubic angle and Cobb angle correlated with the EuroQol-5 dimensions utility score ($r = 0.314$, $p = 0.014$) and EuroQol-visual analogue scale score ($r = -0.291$, $p = 0.043$), respectively. Lumbar lordosis and body mass index correlated with

the lumbar function ($r = 0.285$, $p = 0.047$) and visual analogue scale for leg pain ($r = 0.328$, $p = 0.022$) on the Japanese Orthopaedic Association Back Pain Questionnaire, respectively.

CONCLUSIONS:

The prevalence of radiographic DLS in this study was approximately 20 % and roughly 40 % of the DLS subjects had symptoms. Some spinopelvic parameters may impact the occurrence of symptoms and the QOL in DLS subjects.

KEYWORDS: Chronic low back pain; Lumbar spinal stenosis; Symptomatic degenerative lumbar scoliosis

PMID: 26423747

Schroth method

Scoliosis. 2015 Sep 18;10:24. doi: 10.1186/s13013-015-0048-5. eCollection 2015.

The effect of Schroth exercises added to the standard of care on the quality of life and muscle endurance in adolescents with idiopathic scoliosis-an assessor and statistician blinded randomized controlled trial: "SOSORT 2015 Award Winner".

Schreiber S¹, Parent EC¹, Moez EK¹, Hedden DM², Hill D², Moreau MJ², Lou E², Watkins EM², Southon SC².

Author information

Abstract

BACKGROUND: In North America, care recommendations for adolescents with small idiopathic scoliosis (AIS) curves include observation or bracing. Schroth scoliosis-specific exercises have demonstrated promising results on various outcomes in uncontrolled studies. This randomized controlled trial (RCT) aimed to determine the effect of Schroth exercises combined with the standard of care on quality-of-life (QOL) outcomes and back muscle endurance (BME) compared to standard of care alone in patients with AIS.

MATERIAL AND METHODS: Fifty patients with AIS, aged 10-18 years, with curves 10-45 °, recruited from a scoliosis clinic were randomized to receive standard of care or supervised Schroth exercises plus standard of care for 6 months. Schroth exercises were taught over five sessions in the first two weeks. A daily home program was adjusted during weekly supervised sessions. The assessor and the statistician were blinded. Outcomes included the Biering-Sorensen (BME) test, Scoliosis Research Society (SRS-22r) and Spinal Appearance Questionnaires (SAQ) scores. Intention-to-treat (ITT) and per protocol (PP) linear mixed effects models were analyzed. Because ITT and PP analyses produced similar results, only ITT is reported.

RESULTS: After 3 months, BME in the Schroth group improved by 32.3 s, and in the control by 4.8 s. This 27.5 s difference in change between groups was statically significant (95 % CI 1.1 to 53.8 s, $p = 0.04$). From 3 to 6 months, the self-image improved in the Schroth group by 0.13 and deteriorated in the control by 0.17 (0.3, 95 % CI 0.01 to 0.59, $p = 0.049$). A difference between groups for the change in the SRS-22r pain score transformed to its power of four was observed from 3 to 6 months (85.3, 95 % CI 8.1 to 162.5, $p = 0.03$), where (SRS-22 pain score)⁽⁴⁾ increased by 65.3 in the Schroth and decreased by 20.0 in the control group. Covariates: age, self-efficacy, brace-wear, Schroth classification, and height had significant main effects on some outcomes. Baseline ceiling effects were high: SRS-22r (pain = 18.4 %, function = 28.6 %), and SAQ (prominence = 26.5 %, waist = 29.2 %, chest = 46.9 %, trunk shift = 12.2 % and shoulders = 18.4 %).

CONCLUSIONS: Supervised Schroth exercises provided added benefit to the standard of care by improving SRS-22r pain, self-image scores and BME. Given the high prevalence of ceiling effects on SRS-22r and SAQ questionnaires' domains, we hypothesize that in the AIS population receiving conservative treatments, different QOL questionnaires with adequate responsiveness are needed.

TRIAL REGISTRATION: Schroth Exercise Trial for Scoliosis NCT01610908.

KEYWORDS: Adolescent idiopathic scoliosis; Muscle endurance; Quality of life; Randomized controlled trial; Schroth exercises

PMID: 26413145

56. ATHLETICS

Catchers injuries

Am J Sports Med. 2015 Oct;43(10):2496-500. doi: 10.1177/0363546515597684. Epub 2015 Aug 28.

Epidemiology of Injuries in Major League Baseball Catchers.

Kilcoyne KG¹, Ebel BG², Bancells RL³, Wilckens JH⁴, McFarland EG⁵.

Author information

Abstract

BACKGROUND:

In part because of the perception that many injuries occur during collisions with the catcher at home plate, Major League Baseball (MLB) officials recently implemented rule changes to prevent these injuries. There is little research on the rate, type, and severity of injuries in MLB catchers.

PURPOSE:

To (1) determine the types and severity of injuries to catchers, (2) determine catchers' athlete exposure (AE) rate of injuries, and (3) assess the perception that catchers are at risk for career-ending injuries caused by home plate collisions.

STUDY DESIGN:

Descriptive epidemiology study.

METHODS:

The MLB Electronic Baseball Information System was queried for injuries in catchers during the 2001-2010 seasons categorized by cause (collision vs noncollision), diagnosis, and severity. All collision injuries were confirmed by reviewing publicly accessible records and news media. The injury exposure rate per 1000 AEs was calculated, and the rate of injury, associated days on the disabled list (DL), and injury severity were determined on the basis of cause and location of injury. Poisson regression was used to compare rates among seasons, and significance was set at $P < .05$.

RESULTS:

During the study period, 134 injuries were sustained, resulting in 6801 days lost. The mean time on the DL was 50.8 days (range, 15-236). The average injury rate was 2.75 injuries per 1000 AEs (range, 0.82-5.14). Of those 134 injuries, 20 were collision injuries. Collision injuries resulted in a mean of 39 days (range, 15-93) of DL time, compared with 53 days for noncollision injuries (range, 15-236), which was not a significant difference. No collision injury was career ending. Noncollision injuries more commonly resulted in >100 days on the DL compared with collision injuries ($P = .049$).

CONCLUSION:

Study findings indicated that (1) the most common type of injury to catchers was noncollision injury, (2) the rate of injuries to catchers is lower than previously reported rates for other player positions, and (3) this study did not support the perception that collision injuries are a frequent cause of career-ending injury to catchers.

KEYWORDS: baseball catcher; collision injury; epidemiology; noncollision injury

PMID: 26320222

Pitching and scapula

Am J Sports Med. 2015 Oct;43(10):2445-51. doi: 10.1177/0363546515594379. Epub 2015 Aug 11.

Configuration of the Shoulder Complex During the Arm-Cocking Phase in Baseball Pitching.

Konda S¹, Yanai T², Sakurai S³.

Author information

Abstract

BACKGROUND: The role of the scapula during high-velocity baseball pitching has been described without 3-dimensional kinematic data. It has been speculated that the scapula functions to align the humerus with the spine of the scapula on both the transverse and scapular planes at the end of the arm-cocking phase.

HYPOTHESIS: Two hypotheses were formulated: (1) the scapulothoracic protraction angle correlates with the humerothoracic horizontal adduction angle among participants, and (2) the scapulohumeral rhythm of the humerothoracic elevation is not the same as the normal ratio (2:1) observed widely in controlled abductions.

STUDY DESIGN: Descriptive laboratory study.

METHODS: A total of 20 Japanese professional baseball pitchers were asked to pitch 3 fastballs as they would normally during pitching practice. The 3-dimensional kinematic data of the thorax, scapulae, humeri, and pelvis were recorded using an electromagnetic tracking device operating at 240 Hz. Humerothoracic, scapulothoracic, and glenohumeral joint configurations were determined at the instant of stride-foot contact (SFC) and the end of the arm-cocking phase (MER).

RESULTS: The mean (\pm SD) glenohumeral horizontal adduction ($-6^\circ \pm 7^\circ$) and elevation ($85^\circ \pm 10^\circ$) angles at the MER indicated that the humerus was positioned almost parallel to the spine of the scapula. The mean scapulothoracic protraction angle ($15^\circ \pm 10^\circ$) was significantly correlated with the humerothoracic horizontal adduction angle ($10^\circ \pm 11^\circ$) at the MER ($r = 0.76$, $P < .001$) but not at the SFC ($r = 0.13$, $P = .58$). The scapulohumeral rhythm (4.2 [± 1.9]:1) expressed as the ratio of the glenohumeral elevation angle to the scapulothoracic upward rotation angle at the MER was significantly greater than the normal ratio (2:1) ($P < .01$).

CONCLUSION: The results supported the hypotheses, providing evidence to corroborate the widely accepted concept that the scapula functions to align the humerus with the spine of the scapula so as to limit the glenohumeral joint configuration within the "safe zone" at the MER.

CLINICAL RELEVANCE: Disruption of coordination, such as abnormal patterns including "SICK" scapula (scapular malposition, inferior medial border prominence, coracoid pain, and dyskinesia) and scapular dyskinesia, may result in an abnormal configuration of the glenohumeral joint at the MER.

KEYWORDS: biomechanics; glenohumeral joint; kinematics; scapula; scapular plane

PMID: 26264772

Shoulder ROM in pitchers

Am J Sports Med. 2015 Oct;43(10):2379-85. doi: 10.1177/0363546515594380. Epub 2015 Aug 13.

Deficits in Glenohumeral Passive Range of Motion Increase Risk of Shoulder Injury in Professional Baseball Pitchers: A Prospective Study.

Wilk KE¹, Macrina LC², Fleisig GS³, Aune KT³, Porterfield RA⁴, Harker P⁴, Evans TJ³, Andrews JR³.

Author information

Abstract

BACKGROUND: Shoulder injuries from repetitive baseball pitching continue to be a serious, common problem.

PURPOSE: To determine whether passive range of motion of the glenohumeral joint was predictive of shoulder injury or shoulder surgery in professional baseball pitchers.

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

METHODS: Passive range of motion of the glenohumeral joint was assessed with a bubble goniometer during spring training for all major and minor league pitchers of a single professional baseball organization over a period of 8 successive seasons (2005-2012). Investigators performed a total of 505 examinations on 296 professional pitchers. Glenohumeral external and internal rotation was assessed with the pitcher supine and the arm abducted to 90° in the scapular plane with the scapula stabilized anteriorly at the coracoid process. Total rotation was defined as the sum of internal and external glenohumeral rotation. Passive shoulder flexion was measured with the pitcher supine and the lateral border of the scapula manually stabilized. After examination, shoulder injuries and injury durations were recorded by each pitcher's respective baseball organization and reported to the league as an injury transaction as each player was placed on the disabled list.

RESULTS: Highly significant side-to-side differences were noted within subjects for each range of motion measurement. There were 75 shoulder injuries and 20 surgeries recorded among 51 pitchers, resulting in 5570 total days on the disabled list. Glenohumeral internal rotation deficit, total rotation deficit, and flexion deficit were not significantly related to shoulder injury or surgery. Pitchers with insufficient external rotation (<5° greater external rotation in the throwing shoulder) were 2.2 times more likely to be placed on the disabled list for a shoulder injury (P = .014; 95% CI, 1.2-4.1) and were 4.0 times more likely to require shoulder surgery (P = .009; 95% CI, 1.5-12.6).

CONCLUSION: Insufficient shoulder external rotation on the throwing side increased the likelihood of shoulder injury and shoulder surgery. Sports medicine clinicians should be aware of these findings and develop a preventive plan that addresses this study's findings to reduce pitchers' risk of shoulder injury and surgery.

KEYWORDS: external rotation; glenohumeral internal rotation deficit; labral repair; rotator cuff repair; total rotational motion

PMID: 26272516

59. PAIN

Children of chronic pain sufferers

Pain. 2015 Nov;156(11):2256-66. doi: 10.1097/j.pain.0000000000000293.

Offspring of parents with chronic pain: a systematic review and meta-analysis of pain, health, psychological, and family outcomes.

Higgins KS¹, Birnie KA, Chambers CT, Wilson AC, Caes L, Clark AJ, Lynch M, Stinson J, Campbell-Yeo M.

Author information

Abstract

Offspring of parents with chronic pain may be at risk for poorer outcomes than offspring of healthy parents.

The objective of this research was to provide a comprehensive mixed-methods systematic synthesis of all available research on outcomes in offspring of parents with chronic pain. A systematic search was conducted for published articles in English examining pain, health, psychological, or family outcomes in offspring of parents with chronic pain. Fifty-nine eligible articles were identified (31 population-based, 25 clinical, 3 qualitative), including offspring from birth to adulthood and parents with varying chronic pain diagnoses (eg, mixed pain samples, arthritis). Meta-analysis was used to synthesize the results from population-based and clinical studies, while meta-ethnography was used to synthesize the results of qualitative studies. Increased pain complaints were found in offspring of mothers and of fathers with chronic pain and when both parents had chronic pain. Newborns of mothers with chronic pain were more likely to have adverse birth outcomes, including low birthweight, preterm delivery, caesarian section, intensive care admission, and mortality. Offspring of parents with chronic pain had greater externalizing and internalizing problems and poorer social competence and family outcomes. No significant differences were found on teacher-reported externalizing problems.

The meta-ethnography identified 6 key concepts (developing independence, developing compassion, learning about health and coping, missing out, emotional health, and struggles communicating with parents). Across study designs, offspring of parents with chronic pain had poorer outcomes than other offspring, although the meta-ethnography noted some constructive impact of having a parent with chronic pain.

PMID: 26172553

Chronic pain decision-making

BMC Med Educ. 2015 Oct 1;15(1):164. doi: 10.1186/s12909-015-0441-z.

Examining influential factors in providers' chronic pain treatment decisions: a comparison of physicians and medical students.

Hollingshead NA¹, Meints S², Middleton SK³, Free CA⁴, Hirsh AT⁵.

Author information

Abstract

BACKGROUND:

Chronic pain treatment guidelines are unclear and conflicting, which contributes to inconsistent pain care. In order to improve pain care, it is important to understand the various factors that providers rely on to make treatment decisions. The purpose of this study was to examine factors that reportedly influence providers' chronic pain treatment decisions. A secondary aim was to examine differences across participant training level.

METHODS:

Eighty-five participants (35 medical students, 50 physicians) made treatment decisions for 16 computer-simulated patients with chronic pain. Participants then selected from provided lists the information they used and the information they would have used (had it been available) to make their chronic pain treatment decisions for the patient vignettes.

RESULTS:

Frequency analyses indicated that most participants reported using patients' pain histories (97.6 %) and pain description (95.3 %) when making treatment decisions, and they would have used information about patients' previous treatments (97.6 %) and average and current pain ratings (96.5 %) had this information been available. Compared to physicians, medical students endorsed more frequently that they would have used patients' employment and/or disability status ($p < 0.05$). A greater proportion of medical students wanted information on patients' use of illicit drugs and alcohol to make treatment decisions; while a greater proportion of physicians reported using personal experience to inform their decisions.

DISCUSSION:

This study found providers use patients' information and their own experiences and intuition to make chronic pain treatment decisions. Also, participants of different training levels report using different patient and personal factors to guide their treatment decisions.

CONCLUSIONS:

These results highlight the complexity of chronic pain care and suggest a need for more chronic pain education aimed at medical students and practicing providers.

PMID: 26427937

Complementary therapies

Can J Anaesth. 2015 Oct 14.

Complementary and alternative medicine therapies for the anesthesiologist and pain practitioner: a narrative review.

Woodbury A^{1,2}, Soong SN³, Fishman D^{4,3}, García PS^{4,3}.

Author information

Abstract

PURPOSE:

This narrative review provides an overview of the complementary and alternative medicine (CAM) therapies that anesthesiologists and pain management practitioners commonly encounter along with recommendations for evaluation and implementation.

SOURCE:

A literature search of PubMed was performed using the comprehensive MeSH term, "Complementary Therapies OR Dietary Supplements", and a search was conducted of the various licensing organizations and books published on the topics of CAM and integrative medicine.

PRINCIPAL FINDINGS:

In North America, the most commonly encountered CAM therapies include 1) manipulation and procedural therapies; 2) herbs, nutritional supplements (nutraceuticals), and dietary therapies; and 3) mind-body and energy therapies. Controversy exists regarding many of these therapies, particularly those with a higher risk of harm, such as chiropractic manipulation, acupuncture, and nutraceutical use. Several well-conducted studies were analyzed to show how research in CAM can control for placebo responses. Practical considerations are provided for patients and practitioners interested in pursuing or already employing CAM in perioperative and chronic pain management settings.

CONCLUSIONS:

Complementary and alternative medicine therapies in general may provide a useful adjunct in the management of chronic pain. Nevertheless, many patients are not aware of the risks and benefits of individual therapies. In the perioperative setting, the most concerning CAM therapy is the use of herbs and other supplements that may produce physiologic and metabolic derangements and may interact with prescription medications. Resources exist to aid pain specialists, anesthesiologists, and patients in the evidence-based utilization of CAM therapies.

PMID:26467546

61. FIBROMYALGIA**Central changes in FM**

BMC Neurol. 2015 Oct 20;15(1):210. doi: 10.1186/s12883-015-0472-4.

Increased cortical activation upon painful stimulation in fibromyalgia syndrome.

Üçeyler N¹, Zeller J², Kewenig S³, Kittel-Schneider S⁴, Fallgatter AJ⁵, Sommer C⁶.
Author information

Abstract

BACKGROUND:

Fibromyalgia syndrome (FMS) is a chronic condition characterized by widespread pain and associated symptoms. We investigated cerebral activation in FMS patients by functional near-infrared spectroscopy (fNIRS).

METHODS:

Two stimulation paradigms were applied: a) painful pressure stimulation at the dorsal forearm; b) verbal fluency test (VFT). We prospectively recruited 25 FMS patients, ten patients with unipolar major depression (MD) without pain, and 35 healthy controls. All patients underwent neurological examination and all subjects were investigated with questionnaires (pain, depression, FMS, empathy).

RESULTS:

FMS patients had lower pressure pain thresholds than patients with MD and controls ($p < 0.001$) and reported higher pain intensity ($p < 0.001$). Upon unilateral pressure pain stimulation fNIRS recordings revealed increased bilateral cortical activation in FMS patients compared to controls ($p < 0.05$). FMS patients also displayed a stronger contralateral activity over the dorsolateral prefrontal cortex in direct comparison to patients with MD ($p < 0.05$). While all three groups performed equally well in the VFT, a frontal deficit in cortical activation was only found in patients with depression ($p < 0.05$). Performance and cortical activation correlated negatively in FMS patients ($p < 0.05$) and positively in patients with MD ($p < 0.05$).

CONCLUSION:

Our data give further evidence for altered central nervous processing in patients with FMS and the distinction between FMS and MD.

TRIAL REGISTRATION: ISRCTN registry ID ISRCTN15015327 (24.09.2015).
PMID:26486985

62 A. NUTRITION/VITAMINS

Hyaluronic acid

BMC Musculoskelet Disord. 2015 Oct 6;16(1):284. doi: 10.1186/s12891-015-0735-7.

Hyaluronic acid increases tendon derived cell viability and collagen type I expression in vitro: Comparative study of four different Hyaluronic acid preparations by molecular weight.

Osti L¹, Berardocco M², di Giacomo V³, Di Bernardo G⁴, Oliva F⁵, Berardi AC⁶.

Author information

Abstract

BACKGROUND:

Hyaluronic Acid (HA) has been already approved by Food and Drug Administration (FDA) for osteoarthritis (OA), while its use in the treatment of tendinopathy is still debated. The aim of this study was to evaluate in human rotator cuff tendon derived cells the effects of four different HA on cell viability, proliferation, apoptosis and the expression of collagen type I and collagen type III.

METHODS:

An in vitro model was developed on human tendon derived cells from rotator cuff tears to study the effects of four different HA preparations (Ps) (sodium hyaluronate MW: 500-730 KDa - Hyalgan®, 1000 kDa Artrosulfur HA®, 1600 KDa Hyalubrix® and 2200 KDa Synolis-VA®) at various concentrations. Tendon derived cells morphology were evaluated after 0, 7 and 14 d of culture. Viability, proliferation, apoptosis were evaluated after 0, 24 and 48 h of culture. The expression and deposition of collagen type I and collagen type III were evaluated after 1, 7 and 14 d of culture.

RESULTS:

All HAPs tested increased viability and proliferation, in dose dependent manner. HAPs already reduce apoptosis at 24 h compared to control cells (without HAPs). Furthermore, HAPs stimulated the synthesis of collagen type I in a dose dependent fashion over 14 d, without increase in collagen type III; moreover, in the presence of Synolis-VA® the expression and deposition of collagen type I was significantly higher as compare with the other HAPs.

CONCLUSIONS:

HAPs enhanced viability, proliferation and expression of collagen type I in tendon derived cells.

PMID: 26444018

63. PHARMACOLOGY

Aneurysm's secondary to Fluoroquinolone

JAMA Intern Med. 2015 Oct 5:1-9. doi: 10.1001/jamainternmed.2015.5389.

Risk of Aortic Dissection and Aortic Aneurysm in Patients Taking Oral Fluoroquinolone.

Lee CC¹, Lee MG², Chen YS³, Lee SH², Chen YS⁴, Chen SC², Chang SC⁵.

Author information

Abstract

IMPORTANCE:

Fluoroquinolones have been associated with collagen degradation, raising safety concerns related to more serious collagen disorders with use of these antibiotics, including aortic aneurysm and dissection.

OBJECTIVE:

To examine the relationship between fluoroquinolone therapy and the risk of developing aortic aneurysm and dissection.

DESIGN, SETTING, AND PARTICIPANTS:

We conducted a nested case-control analysis of 1477 case patients and 147 700 matched control cases from Taiwan's National Health Insurance Research Database (NHIRD) from among 1 million individuals longitudinally observed from January 2000 through December 2011. Cases patients were defined as those hospitalized for aortic aneurysm or dissection. One hundred control patients were matched for each case based on age and sex.

EXPOSURES:

Current, past, or any prior-year use of fluoroquinolone. Current use was defined as a filled fluoroquinolone prescription within 60 days of the aortic aneurysm or dissection; past use refers to a filled fluoroquinolone prescription between 61 and 365 days prior to the aortic aneurysm; and any prior-year use refers to having a fluoroquinolone prescription filled for 3 or more days any time during the 1-year period before the aortic aneurysm or dissection.

MAIN OUTCOMES AND MEASURES:

Risk of developing aortic aneurysm or dissection.

RESULTS:

A total of 1477 individuals who experienced aortic aneurysm or dissection were matched to 147 700 controls. After propensity score adjustment, current use of fluoroquinolones was found to be associated with increased risk for aortic aneurysm or dissection (rate ratio [RR], 2.43; 95% CI, 1.83-3.22), as was past use, although this risk was attenuated (RR, 1.48; 95% CI, 1.18-1.86). Sensitivity analysis focusing on aortic aneurysm and dissection requiring surgery also demonstrated an increased risk associated with current fluoroquinolone use, but the increase was not statistically significant (propensity score-adjusted RR, 2.15; 95% CI, 0.97-4.60).

CONCLUSIONS AND RELEVANCE:

Use of fluoroquinolones was associated with an increased risk of aortic aneurysm and dissection. While these were rare events, physicians should be aware of this possible drug safety risk associated with fluoroquinolone therapy.

PMID: 26436523

65. NEUROLOGICAL CONDITIONS

Parkinsonism

Eur Spine J. 2015 Oct 6.

Spinopelvic balance and body image perception in Parkinson's disease: analysis of correlation.

Bissolotti L^{1,2}, Isacco-Grassi F³, Orizio C^{4,5}, Gobbo M^{6,7}, Berjano P⁸, Villafañe JH⁹, Negrini S^{10,11}.

Author information

Abstract

PURPOSE:

The purpose of this study was to describe the association between body image perception and sagittal balance (SB) parameters in Parkinson's Disease (PD) patients.

METHODS:

77 consecutive PD patients were included: 44 males, 33 females; 68.9 ± 6.8 years; 5.3 ± 3.8 years from diagnosis (YFD); Hoehn Yahr (HY) 2.0 ± 0.8 , Unified Parkinson's Disease rating Score-Motor section (UPDRS-M) 11.8 ± 9.3 . Spinopelvic angles and SB were radiographically assessed. Body image perception was assessed through Trunk appearance scale (TAPS) and Stunkard Figure rating scale for BMI. Beck Depression Inventory (BDI) was used to evaluate depressive mood.

RESULTS:

We detected 32 (41.5 % of cohort) Parkinson Disease patients with scoliosis $\geq 15^\circ$ Cobb. The mean calculated BMI was 27.1 ± 3.9 kg/m². According to the Figure Rating Scale, the perceived BMI averaged 27.2 ± 4.5 kg/m², while the mean desired BMI was 24.4 ± 2.7 kg/m², TAPS scored 3.4 ± 0.9 points, while BDI 12.3 ± 7.9 points. TAPS had a weak negative correlation with the duration of disease ($r = -0.25$, $p < 0.05$) and a correlation with H&Y score ($r = 0.28$, $p < 0.05$). Sacral Slope was weakly correlated to the calculated BMI ($r = -0.24$, $p < 0.05$). SSA and SPA had a negative correlation with the TAPS mean score (respectively, $r = -0.36$ and -0.24 , $p < 0.05$). BDI presented a weak correlation with TAPS ($r = 0.27$, $p < 0.05$) but not with self esteemed BMI values ($p > 0.05$).

CONCLUSIONS:

Spinopelvic parameters and depression had a specific and concurrent influence on trunk deformity perception but not on BMI self-esteem.

KEYWORDS: Body image; Parkinson's disease; Spinopelvic balance

PMID: 26441255