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2. LBP

Diabetes and LBP

Chronic low-back pain in adult with diabetes: NHANES 2009–2010

Journal of Diabetes and its Complications, 11/08/2016

Hassoon A, et al.

This study intended to test the hypothesis that diabetes mellitus (DM) is associated with an increased prevalence of chronic low back pain (CLBP) in the general population. The researchers found that adults with diabetes have higher prevalence of chronic low back pain (CLBP), and higher odds of CLBP after adjusting for LBP risk factors

- Data was analyzed for 5106 adults (4591 without DM & 515 with diagnosed DM), who were part of the National Health and Nutrition Examination Survey (NHANES) from 2009 through 2010.
- Adults with DM were older (mean age 54.2 years' vs 42.1 years), more likely to be obese (BMI > 30, 69.5% vs 33.3%), less educated (college or above 44.4% vs 57.3%), had a lower annual income (<\$20,000, 16.8% vs 13.4%), were more likely to be a former smoker (31.5% vs 20.9%), less physically active (43.5% vs 59.4%).
- In adults with DM, the prevalence of CLBP was 19.8% vs. 12.9% in adults without DM (age-adjusted OR 1.46; 95% CI, 1.00–1.94, P = 0.050).
- The association remained significant (OR 1.39; 95% CI, 1.02–1.92, P = 0.041) after the adjustments for CLBP's known risk factors.
- The study reveal that adults with DM have a higher prevalence of CLBP.

5. SURGERY

Type of anesthesia

Anaesthesia. 2016 Oct 22. doi: 10.1111/anae.13702.

Impact of spinal anaesthesia vs. general anaesthesia on peri-operative outcome in lumbar spine surgery: a systematic review and meta-analysis of randomised, controlled trials.

Meng T¹, Zhong Z², Meng L³.

Lumbar spinal surgery is most commonly performed under general anaesthesia.

However, spinal anaesthesia has also been used. We aimed to systematically review the comparative evidence. We only included randomised, controlled trials in this meta-analysis and calculated the risk ratio or standardised mean difference for haemodynamics, blood loss, surgical time, analgesic requirement, nausea and/or vomiting, and length of hospital stay. Eight studies with a total of 625 patients were included. These were considered to be at high risk of bias. Compared with general anaesthesia, the risk ratio (95% CI) with spinal anaesthesia for intra-operative hypertension was 0.31 (0.15-0.64), $I^2 = 0\%$ ($p = 0.002$); for intra-operative tachycardia 0.51 (0.30-0.84), $I^2 = 0\%$ ($p = 0.009$); for analgesic requirement in the postanaesthesia care unit 0.32 (0.24-0.43), $I^2 = 0\%$ ($p < 0.0001$); and for nausea/vomiting within 24 h postoperatively 0.29 (0.18-0.46), $I^2 = 12\%$ ($p < 0.00001$). The standardised mean difference (95% CI) for hospital stay was -1.15 (-1.98 to -0.31), $I^2 = 89\%$ ($p = 0.007$).

There was no evidence of a difference in intra-operative hypotension and bradycardia, blood loss, surgical time, analgesic requirement within 24 h postoperatively, and nausea/vomiting in the postanaesthesia care unit. We conclude that spinal anaesthesia appears to offer advantages over general anaesthesia for lumbar spine surgery.

Fusions

World Neurosurg. 2016 Oct 31. pii: S1878-8750(16)31113-5. doi: 10.1016/j.wneu.2016.10.124.

Considerations in Spinal Fusion Surgery for Chronic Lumbar Pain: Psychosocial Factors, Rating Scales, and Perioperative Patient Education. A Review of the Literature.

Gaudin D¹, Krafcik BM², Mansour TR², Alnemari A³.

OBJECTIVE:

This literature review was conducted to better understand the factors associated with optimal post-operative results following lumbar spinal fusion for chronic back pain, and the current tools used for evaluation.

BACKGROUND:

Despite widespread use of lumbar spinal fusion as a treatment for back pain, outcomes remain variable. Optimizing patient selection can help to reduce adverse outcomes.

METHODS:

The PubMed database was searched for clinical trials related to psychosocial determinants of outcome following lumbar spinal fusion surgery, evaluation of commonly used patient subjective outcome measures, and perioperative cognitive, behavioral, and educational therapies. The reference lists of included studies were also searched by hand for additional studies meeting inclusion and exclusion criteria.

RESULTS:

Patients' perception of good health prior to surgery and low cardiovascular comorbidity predict improved postoperative physical functional capacity and greater patient satisfaction. Depression, tobacco use, and litigation predict poorer outcomes following lumbar fusion. Incorporation of cognitive-behavioral therapy perioperatively can address these psychosocial risk factors and improve outcomes. The SF-36, EQ-5D, visual analog pain scale, brief pain inventory, and ODI can each provide specific feedback which can track patient progress and are important to understand when evaluating the current literature.

CONCLUSIONS:

This review provides a summary of current information and explains commonly used assessment tools to guide clinicians in decision making when caring for patients with lower back pain. When determining a treatment algorithm, physicians must consider predictive psychosocial factors. Furthermore, utilization of perioperative cognitive behavioral therapy and patient education can improve outcomes following lumbar spinal fusion.

7. PELVIC ORGANS/WOMAN'S HEALTH

Menopause

Menopause. 2016 Nov;23(11):1239-1246.

Menopause is associated with articular cartilage degeneration: a clinical study of knee joint in 860 women.

Lou C¹, Xiang G, Weng Q, Chen Z, Chen D, Wang Q, Zhang D, Zhou B, He D, Chen H.

OBJECTIVE:

The purpose of this study was to investigate the association between menopause and severity of knee joint cartilage degeneration using a magnetic resonance imaging-based six-level grading system, with six cartilage surfaces, the medial and lateral femoral condyle, the femoral trochlea, the medial and lateral tibia plateau, and the patella.

METHODS:

The study cohort comprised 860 healthy women (age 36-83 y), and 5,160 cartilage surfaces were analyzed. Age, weight, height, age at natural menopause, and years since menopause (YSM) were obtained. Cartilage degeneration was assessed using a magnetic resonance imaging-based six-level grading system.

RESULTS:

After removing the age, height, and weight effects, postmenopausal women had more severe cartilage degeneration than pre- and perimenopausal women ($P < 0.001$). A positive trend was observed between YSM and severity of cartilage degeneration ($P < 0.05$). Postmenopausal women were divided into seven subgroups by every five YSM. When YSM was less than 25 years, the analysis of covariance indicated a significant difference in medial tibia plateau, medial femoral condyle, trochlea, patella, and total surfaces ($P < 0.05$ or 0.01) between every two groups. When YSM was more than 25 years, the significant difference, however, disappeared in these four surfaces ($P > 0.05$). No significant difference was observed in lateral tibia plateau and lateral femoral condyle in postmenopausal women.

CONCLUSIONS:

Menopause is associated with cartilage degeneration of knee joint. After menopause, cartilage showed progressive severe degeneration that occurred in the first 25 YSM, suggesting estrogen deficiency might be a risk factor of cartilage degeneration of the knee joint. Further studies are needed to investigate whether age or menopause plays a more important role in the progression of cartilage degeneration in the knee joint.

Endometriosis and QOL

Hum Reprod. 2016 Sep 12.

Dyspareunia and depressive symptoms are associated with impaired sexual functioning in women with endometriosis, whereas sexual functioning in their male partners is not affected.

De Graaff AA¹, Van Lankveld J², Smits LJ³, Van Beek JJ⁴, Dunselman GA⁵.

STUDY QUESTION: *To what extent are endometriosis and its related physical and mental symptoms associated with the perceived level of sexual functioning in women and their male partners?*

SUMMARY ANSWER: *Dyspareunia and depressive symptoms are associated with impaired sexual functioning in women with endometriosis, whereas sexual functioning in their male partners is not affected.*

WHAT IS KNOWN ALREADY: *Women with endometriosis suffer from more dyspareunia, lower sexual functioning, and lower quality of life. In qualitative studies, partners of women with endometriosis report that endometriosis affected their quality of life and produced relational distress.*

STUDY DESIGN SIZE, DURATION: *In this cross-sectional study, sexual functioning in women with endometriosis (n = 83) and their partners (n = 74) was compared with sexual functioning in a control group of women attending the outpatient department for issues related to contraception (n = 40), and their partners (n = 26).*

PARTICIPANTS/MATERIALS, SETTING, METHODS: *Women and partners were recruited in the Maastricht University Medical Centre (MUMC) and the VieCuri Medical Centre Venlo between June 2011 and December 2012. All participants were asked to complete a set of online questionnaires.*

MAIN RESULTS AND THE ROLE OF CHANCE: *Response rates were 59.3% (83/140) for women with endometriosis and 52.3% (74/140) for their partners. Response rates in the control group were respectively 43.2% and 27.4% (41/95 and 27/95), of whom 40 women and 26 partners could be included in the study. Women with endometriosis as compared with the control group, reported significantly more frequent pain during intercourse (53% versus 15%, $P < 0.001$); higher levels of chronic pain (median VAS 2.0 cm versus 0.0 cm, $P < 0.001$); more impairment of sexual functioning (median Female Sexual Function Index 25.4 versus 30.6, $P < 0.001$); more impairment of quality of life (median Short Form-12 66.3 versus 87.2, $P < 0.001$); more pain catastrophizing (mean Pain Catastrophizing Scale 17.8 versus 8.5, $P < 0.001$), more depression and anxiety symptoms (median Hospital Anxiety and Depression Scale for depression 7 versus 4, $P < 0.001$ and for anxiety 4 versus 1, $P < 0.001$). Sexual functioning was comparable between male partners of women with endometriosis and male partners of the control group based on the International Index of Erectile Function. Logistic regression analyses showed that dyspareunia (OR 0.54; 95% CI 0.39-0.75) and depressive symptoms (OR 0.761; 95% CI 0.58-0.99) were independent and significant negative predictors for sexual functioning. Chronic pelvic pain (OR 0.53; 95% CI 0.35-0.81) and depressive symptoms (OR 0.65; 95% CI 0.44-0.96) were independent and significant negative predictors for quality of life.*

LIMITATIONS, REASONS FOR CAUTION: *Patient recruitment was performed in one tertiary care centre and to a lesser extent one general hospital, possibly leading to an over-representation of patients with more severe endometriosis. All participating women had a partner and are therefore 'survivors' in relationship terms. This may have led to an underestimation of the impact of endometriosis on sexual functioning.*

WIDER IMPLICATIONS OF THE FINDINGS:

It would be worthwhile to further explore the role of depressive symptoms in women with symptomatic endometriosis and to assess the effect of treatment of depressive symptoms on sexual functioning and quality of life. The fact that the partners did not report impaired sexual functioning could be a reassuring thought to women that might be discussed in the consulting room.

Pelvic pain and hormonal supplementation

Comparison of combined hormonal vaginal ring and low dose combined oral hormonal pill for the treatment of idiopathic chronic pelvic pain: A randomised trial

European Journal of Obstetrics & Gynecology and Reproductive Biology, 11/11/2016

Priya K, et al.

For this study, researchers think about the efficacy and acceptability of combined hormonal vaginal ring with combined oral hormonal pill in women with idiopathic chronic pelvic pain. Exhibit examine shows for the first time that both vaginal and oral hormonal therapy are useful in the treatment of idiopathic chronic pelvic pain and vaginal ring might be a superior decision with higher satisfaction rate and fewer side effects.

Methods

- In this study a randomized prospective interventional trial was conducted.
- A sum of 60 women with idiopathic chronic pelvic pain were enrolled in this study.
- Women were randomized into two groups of 30 each.
- In every gathering, treatment was given for 84 days utilizing either combined vaginal ring or combined oral hormonal pill.
- Hormonal vaginal ring releases 15 mcg of ethinyl estradiol and 120 mcg of the etonogestrel every day while the hormonal pill contained 30 mcg of ethinyl estradiol and 150 mcg of levonorgestrel.
- There was no ring or pill-free week. After every 28 days, pain relief was measured utilizing visual analogue scale (VAS), and verbal rating score (VRS) calculated by summing dysmenorrhea, non-cyclic pelvic pain (NCCP) and deep dyspareunia scores.
- Side effects, compliance, satisfaction, and user acceptability were also measured.
- Information was analyzed utilizing various parametric and non-parametric tests.

Results

- Reduction in mean VAS score at end of treatment in ring group was 6.23 (95% confidence interval [CI], 5.45-7.01; $p < 0.001$) when contrasted with 5.53 in pill group (95% CI, 4.83-6.23; $p < 0.001$).
- Diminishment in mean VRS score was 5.63 in ring users (95% CI, 4.84-6.42; $p < 0.001$) versus 4.36 in pill users (95% CI, 3.63-5.10; $p < 0.001$).
- A essentially higher persistent relief in NCCP score was seen in vaginal ring group when contrasted with oral pill group at end of one month after stopping treatment.
- Compliance, satisfaction, and user acceptability were higher in ring users (80%) than pill users (70%) and a higher incidence of nausea was seen in pill group.

8. VISCERA

IBS and genetics

J Pathol. 2016 Oct 26. doi: 10.1002/path.4817.

The genetic background of Inflammatory Bowel Disease: From correlation to causality.

Uniken Venema WT¹, Voskuil MD¹, Dijkstra G¹, Weersma RK¹, Festen EA^{2,3}.

Recent studies have greatly improved our insight into the genetic background of Inflammatory Bowel Disease (IBD).

New high throughput technologies and large-scale international collaborations have contributed to the identification of 200 independent genetic risk loci for IBD. However, in most of these loci it is unclear which gene conveys the risk for IBD. More importantly, it is unclear which variant within or near the gene is causal to the disease. Using targeted GWAS, imputation, re-sequencing of risk loci and in silico fine-mapping of densely typed loci, several causal variants have been identified in IBD risk genes, and various pathological pathways have been uncovered. Current research in the field of IBD focuses on the effect of these causal variants on gene expression and protein function. However, more elements than only the genome must be taken into account to disentangle the multifactorial pathology of IBD. The genetic risk loci identified to date only explain a small part of genetic variance in disease risk. Currently, large multi-omics studies are incorporating factors, ranging from the gut microbiome to the environment.

In this review we present the progress that has been made in IBD genetic research and stress the importance of studying causality to increase our understanding of the pathogenesis of IBD. We highlight important causal genetic variants in the candidate genes NOD2, ATG16L1, IRGM, IL23R, CARD9, RNF186 and PRDM1. We describe their downstream effects on protein function and their direct effects on the gut immune system. Furthermore, we discuss the future role of genetics in unravelling disease mechanisms in IBD

IBS and probiotics

Turk J Gastroenterol. 2016 Sep;27(5):439-443. doi: 10.5152/tjg.2016.16301.

Efficacy of synbiotic, probiotic, and prebiotic treatments for irritable bowel syndrome in children: A randomized controlled trial.

Baştürk A¹, Artan R, Yılmaz A.

BACKGROUND/AIMS:

Irritable bowel syndrome (IBS) is an important health problem that presents serious social burdens and high costs. Our study investigated the efficacy of synbiotic (Bifidobacterium lactis B94 with inulin), probiotic (B. lactis B94), and prebiotic (inulin) treatment for IBS in a pediatric age group.

MATERIAL AND METHODS:

This study was randomized, double-blind, controlled, and prospective in design and included 71 children between the ages of 4 and 16 years who were diagnosed with IBS according to the Rome III criteria. The first group received synbiotic treatment [5×10⁹ colony forming units (CFU) of B. lactis B94 and 900 mg inulin]; the second group received probiotic treatment (5×10⁹ CFU B. lactis B94), and the third group received prebiotic treatment (900 mg inulin) twice daily for 4 weeks.

RESULTS:

Probiotic treatment improved belching-abdominal fullness (p<0.001), bloating after meals (p=0.016), and constipation (p=0.031), and synbiotic treatment improved belching-abdominal fullness (p=<0.001), bloating after meals (p=0.004), constipation (p=0.021), and mucus in the feces (p=0.021). The synbiotic group had a significantly higher percentage of patients with full recovery than the prebiotic group (39.1% vs. 12.5%, p=0.036).

CONCLUSION:

Administration of synbiotics and probiotics resulted in significant improvements in initial complaints when compared to prebiotics. Additionally, there was a significantly higher number of patients with full recovery from IBS symptoms in the synbiotic group than in the prebiotic group. Therefore, the twice daily administration of synbiotics is suggested for the treatment of children with IBS.

9. THORACIC SPINE

Rib fracture management

Scand J Trauma Resusc Emerg Med. 2016 Oct 28;24(1):128.

Physical function and pain after surgical or conservative management of multiple rib fractures - a follow-up study.

Fagevik Olsén M^{1,2}, Slobod M³, Klarin L⁴, Caragounis EC⁵, Pazooki D⁵, Granhed H⁵.

BACKGROUND:

There is scarce knowledge of physical function and pain due to multiple rib fractures following trauma. The purpose of this follow-up was to assess respiratory and physical function, pain, range of movement and kinesiophobia in patients with multiple rib fractures who had undergone stabilizing surgery and compare with conservatively managed patients.

METHODS:

A consecutive series of 31 patients with multiple rib fractures who had undergone stabilizing surgery were assessed >1 year after the trauma concerning respiratory and physical function, pain, range of movement in the shoulders and thorax, shoulder function and kinesiophobia. For comparison, 30 patients who were treated conservatively were evaluated with the same outcome measures.

RESULTS:

The results concerning pain, lung function, shoulder function and level of physical activity were similar in the two groups. The patients who had undergone surgery had a significantly larger range of motion in the thorax ($p < 0.01$) and less deterioration in two items in Disability Rating Index (sitting and standing bent over a sink) ($p < 0.05$).

DISCUSSION:

It is questionable whether the control group is representative since the majority of patients were invited but refused to participate in the follow-up. In addition, this study is too small to make a definitive conclusion if surgery is better than conservative treatment. But we see some indications, such as a tendency for decreased pain, better thoracic range of motion and physical function which would indicate that surgery is preferable. If operation technique could improve in the future with a less invasive approach, it would presumably decrease post-operative pain and the benefit of surgery would be greater than the morbidity of surgery.

CONCLUSIONS:

Patients undergoing surgery have a similar long-term recovery to those who are treated conservatively except for a better range of motion in the thorax and fewer limitations in physical function. Surgery seems to be beneficial for some patients, the question remains which patients.

12 B. CERVICAL SURGERIES**Fusion vs. arthroplasty**

Eur Spine J. 2016 Oct 22.

Anterior cervical discectomy and fusion versus cervical arthroplasty for the management of cervical spondylosis: a meta-analysis.

Ma Z^{1,2}, Ma X¹, Yang H³, Guan X¹, Li X⁴.

PURPOSE:

The aim of this study was to compare the efficacy and safety of anterior cervical discectomy and fusion (ACDF) and cervical arthroplasty for patients with cervical spondylosis.

METHODS:

PubMed, Embase, and Cochrane Library were used to search for relevant articles published prior to April 2016 to identify studies comparing ACDF and cervical arthroplasty involving patients with cervical spondylosis. Relative risks (RR) and mean differences (MD) were used to measure the efficacy and safety of ACDF and cervical arthroplasty using the random effects model.

RESULTS:

The meta-analysis of 17 studies involved 3122 patients diagnosed with cervical spondylosis. Patients undergoing ACDF showed lower overall success rate (RR 0.84; 95 % CI 0.77-0.92; $P < 0.001$), higher VAS score (MD 0.36; 95 % CI 0.08-0.64; $P = 0.011$), and shorter mean surgical duration (MD -1.62; 95 % CI -2.80 to -0.44; $P = 0.007$) when compared with cervical arthroplasty. However, the association between ACDF therapy and the risk of mean blood loss (MD -0.16; 95 % CI -0.34 to 0.02; $P = 0.082$), mean hospitalization (MD 0.02; 95 % CI -0.31 to 0.36; $P = 0.901$), patient satisfaction (RR 0.96; 95 % CI 0.92-1.00; $P = 0.066$), neck disability index (MD 0.20; 95 % CI -0.05 to 0.44; $P = 0.113$), reoperation (RR 1.25; 95 % CI 0.64-2.41; $P = 0.514$), or complication (RR 1.17; 95 % CI 0.90-1.52; $P = 0.242$) was not statistically significant.

CONCLUSIONS:

Patients undergoing ACDF therapy tended to exhibit lower overall success rate, higher VAS score, and decreased mean surgical duration when compared with patients treated with cervical arthroplasty.

Osteophytes

Clin Spine Surg. 2016 Nov;29(9):E482-E487.

Long-term Results of Surgical Treatment for Symptomatic Anterior Cervical Osteophytes: A Case Series With Review of the Literature.

Vodičar M¹, Košak R, Vengust R.

PURPOSE:

Presentation of a case series (10 patients) with surgical treatment of symptomatic anterior cervical osteophytes, a review of the latest literature and discussion of surgical methods.

OBJECTIVE:

To present our results of the surgical treatment and compare them with the existing literature. On the basis of the gathered data, we aim to propose an optimal choice of surgical treatment.

SUMMARY OF BACKGROUND DATA:

Anterior cervical osteophytes rarely cause symptoms that require surgical treatment, which disables bigger cohort analysis. Surgery always includes anterior osteophyte resection. Some authors propose instrumented anterior fusion after osteophyte resection as the first choice of surgery in order to prevent regrowth of osteophytes, whereas others support resection without fusion because of beneficial long-term results.

METHODS:

Diagnostics included plain radiography, contrast esophagography, computed tomography and/or magnetic resonance imaging. Treatment consisted of left lateral cervicotomy and osteophyctomy. We performed a systematic review of the literature from 2006.

RESULTS:

Average age at surgery was 69.5 years (63-77 y), average follow-up 61.9 months (15-117 mo). Twenty-five osteophytes were resected, with average size of 12.7 mm (4-22 mm) preoperatively and 5.12 mm (0-12 mm) at final follow-up. Average functional outcome swallowing scale score before surgery was 3.3 (2-5) and 1.2 (0-5) at final follow-up. Only 1 patient had recurrence of symptoms because of osseous etiology.

CONCLUSIONS:

Symptomatic ventral cervical osteophytes can be successfully treated by surgery. In the majority of patients, osteophytes do not regrow significantly in the long term, precluding the need for prophylactic instrumented fusion after osteophyte resection.

13. CRANIUM/TMJ**Trigeminal neuropathy**

Neurosurgery. 2016 Nov;79(5):655-666.

Clinical Significance of Invasive Motor Cortex Stimulation for Trigeminal Facial Neuropathic Pain Syndromes.

Rasche D¹, Tronnier VM.

BACKGROUND:

Invasive neuromodulation of the cortical surface for various chronic pain syndromes has been performed for >20 years. The significance of motor cortex stimulation (MCS) in chronic trigeminal neuropathic pain (TNP) syndromes remains unclear. Different techniques are performed worldwide in regard to operative procedure, stimulation parameters, test trials, and implanted materials.

OBJECTIVE:

To present the clinical experiences of a single center with MCS, surgical approach, complications, and follow-up as a prospective, noncontrolled clinical trial.

METHODS:

The implantation of epidural leads over the motor cortex was performed via a burr hole technique with neuronavigation and intraoperative neurostimulation. Special focus was placed on a standardized test trial with an external stimulation device and the implementation of a double-blinded or placebo test phase to identify false-positive responders.

RESULTS:

A total of 36 patients with TNP were operated on, and MCS was performed. In 26 of the 36 patients (72%), a significant pain reduction from a mean of 8.11 to 4.58 (on the visual analog scale) during the test trial was achieved ($P < .05$). Six patients were identified as false-positive responders (17%). At the last available follow-up of 26 patients (mean, 5.6 years), active MCS led to a significant pain reduction compared with the preoperative pain ratings (mean visual analog scale score, 5.01; $P < .05$).

CONCLUSION:

MCS is an additional therapeutic option for patients with refractory chronic TNP, and significant long-term pain suppression can be achieved. Placebo or double-blinded testing is mandatory

TMJ and neck

J Headache Pain. 2016 Dec;17(1):103. Epub 2016 Nov 3.

Chronic Temporomandibular Disorders: disability, pain intensity and fear of movement.

Gil-Martínez A^{1,2}, Grande-Alonso M³, López-de-Uralde-Villanueva I^{4,3}, López-López A^{5,6}, Fernández-Carnero J^{4,3,5,7}, La Touche R^{4,3}.

BACKGROUND:

The objective was to compare and correlate disability, pain intensity, the impact of headache on daily life and the fear of movement between subgroups of patients with chronic temporomandibular disorder (TMD).

METHODS:

A cross-sectional study was conducted in patients diagnosed with chronic painful TMD. Patients were divided into: 1) joint pain (JP); 2) muscle pain (MP); and 3) mixed pain. The following measures were included: Craniomandibular pain and disability (Craniofacial pain and disability inventory), neck disability (Neck Disability Index), pain intensity (Visual Analogue Scale), impact of headache (Headache Impact Test 6) and kinesiophobia (Tampa Scale of Kinesiophobia-11).

RESULTS:

A total of 154 patients were recruited. The mixed pain group showed significant differences compared with the JP group or MP group in neck disability ($p < 0.001$, $d = 1.99$; and $p < 0.001$, $d = 1.17$), craniomandibular pain and disability ($p < 0.001$, $d = 1.34$; and $p < 0.001$, $d = 0.9$, respectively), and impact of headache ($p < 0.001$, $d = 1.91$; and $p < 0.001$, $d = 0.91$, respectively). In addition, significant differences were observed between JP group and MP group for impact of headache ($p < 0.001$, $d = 1.08$). Neck disability was a significant covariate (37 % of variance) of craniomandibular pain and disability for the MP group ($\beta = 0.62$; $p < 0.001$). In the mixed chronic pain group, neck disability ($\beta = 0.40$; $p < 0.001$) and kinesiophobia ($\beta = 0.30$; $p = 0.03$) were significant covariate (33 % of variance) of craniomandibular pain and disability.

CONCLUSION:

Mixed chronic pain patients show greater craniomandibular and neck disability than patients diagnosed with chronic JP or MP. Neck disability predicted the variance of craniofacial pain and disability for patients with MP. Neck disability and kinesiophobia predicted the variance of craniofacial pain and disability for those with chronic mixed pain.

Insomnia**A longitudinal twin and sibling study of associations between insomnia and depression symptoms in young adults**

SLEEP, 11/10/2016

Gregory AM, et al.

In this study, the researchers aim to estimate genetic and environmental influences on the associations between insomnia and depression symptoms concurrently and longitudinally. While genetic impacts play a modest role in insomnia and depression symptoms separately, they seem to play a more central role in concurrent and longitudinal associations between these phenotypes. This ought to be acknowledged in theories explaining these common associations.

Methods

- For this study, behavioral genetic analyses were conducted on data from the British longitudinal G1219 twin/sibling study.
- 1556 twins and siblings took an interest at Time 1 (mean age = 20.3 years, SD = 1.76).
- 862 partook at Time 2 (mean age = 25.2 years, SD = 1.73 years).
- Members finished the Insomnia Symptoms Questionnaire and the Short Mood and Feelings Questionnaire to assess symptoms of insomnia and depression respectively.

Results

- Researchers found that genetic impacts accounted for 33% to 41% of the variance of the phenotypes.
- The phenotypic relationships were moderate ($r = 0.34$ to $r = 0.52$).
- The genetic connections between the variables were high (0.73–1.00).
- Genetic impacts accounted for a substantial proportion of the relationship between variables (50% to 90%).
- Results revealed that non-shared environmental impacts clarified the rest of the variance and covariance of the traits.

CPAP and vit. D

Vitamin D status of male OSAS patients improved after long-term CPAP treatment mainly in obese subjects

Sleep Medicine, 11/09/2016

Liguori C, et al.

For this study, researchers assess the impact of one-year valuable continuous positive airway pressure (CPAP) treatment on serum vitamin D levels in middle-aged men influenced by obstructive sleep apnea syndrome (OSAS). This study documented that long-term CPAP treatment is a viable therapeutic choice for correcting both sleep apnea condition and vitamin D deficiency in middle-aged male OSAS patients. Altogether, this impact was more evident in obese subjects and possibly represents a valid therapeutic strategy to ensure sufficient vitamin D levels in those patients, which frequently demonstrate a deficient vitamin D status.

Methods

- In this study researchers conducted a secondary examination identified with a previously published observational study about the impact of short-term CPAP therapy on serum vitamin D levels in severe OSAS (Apnea-Hypopnea Index –AHI– >30/h) patients.
- In the present study, they included patients taking an interest to the past examination who repeated serum vitamin D assessment following one year of helpful CPAP treatment, and contrasted with control group of OSAS patients with scarce compliance to CPAP treatment.
- OSAS patients with helpful utilization of CPAP treatment were distributed in obese (Body Mass Index – BMI \geq 30) and non-obese (BMI<30).
- Additionally, the mean change between baseline and one-year follow-up (Δ) of serum vitamin D levels was connected with demographic, polygraphic and clinical information throughout a multiple regression investigation.

Results

- They documented the significant increase of serum vitamin D levels following one year of CPAP treatment in the OSAS group (n=39, p<0.001) and in both subgroups of obese (n=23, p<0.01) and non-obese (n=16, p<0.01) OSAS patients.
- Then again, CSAS patients with a scarce compliance to CPAP therapy did not change serum vitamin D levels following one year (n=10, p>0.05).
- OSAS patients with beneficial CPAP treatment demonstrated higher vitamin D serum levels after one year and a more frequent shift from insufficient to sufficient vitamin D status contrasted with OSAS patients not adequately utilizing CPAP treatment.
- In particular, the OSAS group with more obese patients shifted from insufficient (\leq 20 ng/mL) to sufficient ($>$ 20 ng/mL) vitamin D status after CPAP therapy than non-obese patients (p<0.05).
- They found higher Δ of vitamin D serum levels, Epworth Sleepiness Scale score, and AHI in obese contrasted with non-obese OSAS patients.

- At long last, BMI obtained at baseline positively connected with Δ of vitamin D serum levels.

14. HEADACHES

Somatosensory changes in migraine's

Cephalalgia. 2016 Nov 4. pii: 0333102416677050.

Somatosensory temporal discrimination remains intact in tension-type headache whereas it is disrupted in migraine attacks.

Vuralli D^{1,2}, Boran HE^{1,2}, Cengiz B³, Coskun O¹, Bolay H^{4,2}.

BACKGROUND AND OBJECTIVE:

Somatosensory temporal discrimination was recently reported as prolonged during migraine attacks, which is consistent with disrupted sensorial perception in migraine. However, knowledge about central sensory processing in tension-type headache is still lacking. This prospective, controlled study aimed to investigate somatosensory temporal discrimination thresholds in tension-type headache.

METHODS:

The study included 10 tension-type headache patients, 10 migraine patients and 10 healthy volunteers without headache. Somatosensory temporal discrimination thresholds were evaluated during the headache attacks of tension-type headache and migraine patients.

RESULTS:

Somatosensory temporal discrimination thresholds of tension-type headache patients (39.0 ± 5.5 ms for the right hand and 40.6 ± 4.6 ms for the left hand) were significantly lower than those of episodic migraine patients (137.1 ± 35.8 ms for the right hand and 118.4 ± 34.3 ms for the left hand, $p < 0.0001$ and $p < 0.0001$ respectively), and comparable to those of healthy volunteers (38.6 ± 5.3 ms for the right hand and 38.3 ± 7.2 ms for the left hand, $p = 0.79$ and $p = 0.45$ respectively).

CONCLUSION:

Central sensory processing, as tested by somatosensory temporal discrimination, was remarkably disrupted during the headache attacks in migraineurs, whereas it remained intact in the tension-type headache patients.

Brain changes

J Headache Pain. 2016 Dec;17(1):100. Epub 2016 Oct 24.

Thalamo-cortical network activity between migraine attacks: Insights from MRI-based microstructural and functional resting-state network correlation analysis.

Coppola G¹, Di Renzo A², Tinelli E³, Lepre C⁴, Di Lorenzo C⁵, Di Lorenzo G⁶, Scapeccia M³, Parisi V², Serrao M⁷, Colonnese C^{3,8}, Schoenen J⁹, Pierelli F^{7,8}.

BACKGROUND:

Resting state magnetic resonance imaging allows studying functionally interconnected brain networks. Here we were aimed to verify functional connectivity between brain networks at rest and its relationship with thalamic microstructure in migraine without aura (MO) patients between attacks.

METHODS:

Eighteen patients with untreated MO underwent 3 T MRI scans and were compared to a group of 19 healthy volunteers (HV). We used MRI to collect resting state data among two selected resting state networks, identified using group independent component (IC) analysis. Fractional anisotropy (FA) and mean diffusivity (MD) values of bilateral thalami were retrieved from a previous diffusion tensor imaging study on the same subjects and correlated with resting state ICs Z-scores.

RESULTS:

In comparison to HV, in MO we found significant reduced functional connectivity between the default mode network and the visuo-spatial system. Both HV and migraine patients selected ICs Z-scores correlated negatively with FA values of the thalamus bilaterally.

CONCLUSIONS:

The present results are the first evidence supporting the hypothesis that an abnormal resting within networks connectivity associated with significant differences in baseline thalamic microstructure could contribute to interictal migraine pathophysiology

16. CONCUSSIONS

Impact of

Clin J Sport Med. 2016 Sep;26(5):386-90. doi: 10.1097/JSM.0000000000000268.

Young Athletes' Concerns About Sport-Related Concussion: The Patient's Perspective.

Stein CJ¹, MacDougall R, Quatman-Yates CC, Myer GD, Sugimoto D, Dennison RJ, Meehan WP 3rd.

OBJECTIVE:

Few studies have examined the experience and concerns of the concussed athlete. The purpose of this study was to identify the most pressing concerns of athletes with concussion.

DESIGN:

Cross-sectional survey of athletes who presented for evaluation of a new sport-related concussion during an 8-month period.

SETTING:

Tertiary-level sports medicine division of a large academic pediatric medical center.

PARTICIPANTS:

One hundred twenty one patients (67 male, 54 female) aged 8 to 18 years who had sustained a sport-related concussion participated in the study by responding to "What is the worst thing for you about having a concussion?" on the study questionnaire. Questionnaires were completed in the clinic waiting room before the visit with a provider.

INTERVENTION:

Inductive content analysis was used to identify themes in the responses to the study question.

MAIN OUTCOME MEASURES:

Age, sex, sport played at the time of the current injury, history of previous concussion, known contacts with concussion, and subjective report of worst aspect of concussion.

RESULTS:

Seventy respondents (57.9%) cited symptoms, and 68 (56.2%) reported loss of activity as the worst part of concussion, including 17 (14.0%) who listed both symptoms and loss of activity.

CONCLUSIONS:

Over half of concussed athletes indicate that the most distressing part of the injury is loss of activities, which may result from symptoms of the injury itself and/or the prescribed treatment.

CLINICAL RELEVANCE:

Health care providers should not underestimate the degree to which symptoms and loss of activities affect young athletes' general well-being. In addition to the negative impact of concussion symptoms, there is an obvious cost of physical, cognitive, and social activity restrictions for patients recovering from sport-related concussions that should be explicitly addressed.

Sleep and brain trauma

Individuals with pain need more sleep in the early stage of mild traumatic brain injury

Yoshitaka Suzuki Samar Khoury Héjar El-Khatib Jean-Marc Chauny Jean Paquet ,
Jean-François Giguère Ronald Denis Nadia Gosselin Gilles J. Lavigne Caroline Arbour

DOI: <http://dx.doi.org/10.1016/j.sleep.2016.06.033>

Highlights

- Compared to pain-free patients with mild traumatic brain injury (mTBI), significantly higher percentages of mTBI patients with pain were found to require more than 8 hours of sleep per day and to be frequent nappers at 1 month postinjury.
- Correcting for age and depression, poorer pain-related quality of life was also found to be a significant predictor of sleep duration exceeding 8 hours per day at 1 month.
- Pain could be associated with a more pronounced need for sleep in about one-third of mTBI patients during early recovery.
- Unalleviated pain should be looked for in all mTBI patients reporting new-onset sleep disorder, not only those with insomnia.

Abstract**Objective**

Hypersomnia is frequently reported after mild traumatic brain injury (mTBI), but its cause(s) remain elusive. This study examined sleep/wake activity after mTBI and its association with pain, a comorbidity often associated with insomnia.

Methods

Actigraphy recording was performed for 7 ± 2 consecutive days in 56 individuals at 1 month post-mTBI (64% male; 38 ± 12 years), 24 individuals at 1 year post-mTBI (58% male; 44 ± 11 years), and in 20 controls (50% male; 37 ± 12 years). Pain intensity and its effect on quality of life was assessed with a visual analogue scale and the Short Form Health Survey (SF-36) bodily pain subscale.

Results

Overall, few differences in sleep/wake patterns were found between mTBI patients and controls. However, individuals with higher percentages of mTBI with moderate-to-severe pain were found to require more than 8 hours of sleep per day (37% vs 11%; $p = 0.04$) and to be frequent nappers (defined as those who took three or more naps per week) (42% vs 22%; $p = 0.04$) compared to those with mild or no pain at 1 month postinjury. Correcting for age and depression, The SF-36 score was found to be a significant predictor of sleep duration exceeding 8 hours per day at 1 month (odds ratio = 0.95; 95% confidence interval = 0.92–0.99; $p = 0.01$), but not at 1 year post-mTBI. Pain and increased sleep need (in terms of hours per day or napping frequency) were found to co-exist in as much as 29% of mTBI patients at 1 month postinjury.

Conclusion

Pain could be associated with more pronounced sleep need in about one-third of mTBI patients during early recovery. Unalleviated pain, found in more than 60% of mTBI patients, should

therefore be looked for in all mTBI patients reporting new onset of sleep disorder, not only in those with insomnia.

19. GLENOHUMERAL/SHOULDER

Impact of optimism

Optimism Moderates the Influence of Pain Catastrophizing on Shoulder Pain Outcome: A Longitudinal Analysis

Authors: Rogelio A. Coronado, PT, PhD¹, Corey B. Simon, DPT, PhD^{2,3}, Trevor A. Lentz, PT², Charles W. Gay, DC, PhD⁴, Lauren N. Mackie, MS², Steven Z. George, PT, PhD^{2,3,5}

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:0 Issue:0 Pages:**1–32 **DOI:**10.2519/jospt.2017.7068

Study Design

Secondary analysis of prospectively collected data.

Background

An abundance of evidence has highlighted the influence of pain catastrophizing and fear-avoidance on clinical outcomes. Less is known about the interaction of positive psychological resources with these pain-associated distress factors.

Objective

To assess if optimism moderates the influence of pain catastrophizing and fear-avoidance on 3-month clinical outcomes in patients with shoulder pain.

Methods Data from 63 individuals with shoulder pain (mean age (SD) = 38.8 (14.9), n female = 30) were examined. Demographic, psychological, and clinical characteristics were obtained at baseline. Validated measures were used to assess optimism (Life Orientation Test-Revised), pain catastrophizing (Pain Catastrophizing Scale), fear-avoidance (Fear-Avoidance Beliefs Questionnaire-Physical Activity subscale), shoulder pain intensity (Brief Pain Inventory), and shoulder function (Pennsylvania Shoulder Score-Function subscale). Shoulder pain and function were reassessed at 3 months. Regression models assessed the influence of 1) pain catastrophizing and optimism and 2) fear-avoidance and optimism. The final multivariable models controlled for factors of age, sex, education, and baseline scores and included 3 month pain intensity and function as separate dependent variables.

Results Shoulder pain (mean difference = -1.6 [95% CI: -2.1; -1.2], $p < 0.05$) and function (mean difference = 2.4 [95% CI: 0.3; 4.4], $p < 0.05$) improved over 3 months. In multivariable analyses, there was an interaction between pain catastrophizing and optimism (beta = 0.19 [95% CI = 0.02; 0.35], $p < 0.05$) for predicting 3-month shoulder function ($F = 16.8$, r -squared = 0.69, $p < 0.05$), but not pain ($p > 0.05$). Further examination of the interaction with the Johnson-Neyman technique showed that higher levels of optimism lessened the influence of pain catastrophizing on function. There was no moderation of fear-avoidance beliefs ($p > 0.05$).

Conclusion

Optimism decreased the negative influence of pain catastrophizing on shoulder function, but not pain intensity. Optimism did not alter the influence of fear avoidance beliefs on these outcomes.

Level of Evidence

Prognosis, Level 2b. *J Orthop Sports Phys Ther*, Epub 5 Nov 2016. doi:10.2519/jospt.2017.7068

Keyword: catastrophization, optimism, psychology, regression analysis, shoulder pain

25. WRIST AND HAND

Obesity and OA

Body mass index and hand osteoarthritis susceptibility: An updated meta-analysis

International Journal of Rheumatic Diseases, 11/10/2016

Jiang L, et al.

The outcomes from this study displayed that increased body mass index contributes to a positively moderate effect on susceptibility to hand osteoarthritis, as defined radiographically and/or radiographically and clinically. The effects vary by study design and osteoarthritis definition.

Methods

- The clinicians conducted a systematic review and meta-analysis.
- This meta-analysis and meta-regression was executed to determine all English-language articles that quantitatively assess the strength of associations between body mass index and hand osteoarthritis risk.
- Study-specific incremental estimates were standardized to identify the risk correlated with a 5 kg/m² increase in body mass index.
- They performed the study according to the guidelines for the meta-analysis of observational studies in epidemiology.
- They enrolled 21 studies, 13 were cross-sectional studies, three were case control studies and five were cohort studies.

Results

- The pooled summary estimates were 1.10 (95%CI: 0.98–1.24) with no significant difference (P = 0.09).
- In this subgroup analysis, finding shows that body mass index was positively associated with hand osteoarthritis in cross-sectional studies (1.05 [95%CI: 1.02–1.08] P < 0.01), while with no significant difference was found in case-control studies (1.28 [95%CI: 0.87–1.88]) and in cohort studies (1.06 [95%CI: 0.71–1.58]) (P = 0.21 and P = 0.77, respectively).
- Importantly, a weak but significant effect on radiographic hand osteoarthritis risk was found.
- The summary estimates were 1.06 (95%CI: 1.02–1.10) in studies defined by radiography and 1.25 (95%CI: 1.06–1.49) by radiography and clinically (P < 0.01 and P = 0.01, respectively).

30 A. IMPINGEMENT**Ethnicity and cam**

Am J Sports Med. 2016 Aug 4. pii: 0363546516656163.

Ethnic Differences in Bony Hip Morphology in a Cohort of 445 Professional Male Soccer Players.

Mosler AB¹, Crossley KM², Waarsing JH³, Jomaah N⁴, Weir A⁵, Hölmich P⁶, Agricola R⁷.

BACKGROUND:

Participation in high-impact athletic activities has recently been associated with a higher prevalence of cam deformity. Bony hip morphology has also emerged as an important factor in the development of hip osteoarthritis. However, it is unknown whether bony morphology differs between ethnicities in athletes participating in high-impact sports.

PURPOSE:

To investigate whether the prevalence of specific bony hip morphological abnormalities differed between professional male soccer players of diverse ethnic backgrounds.

STUDY DESIGN:

Cross-sectional study; Level of evidence, 3.

METHODS:

Professional male soccer players from an entire league attending preparticipation screening were invited to participate in this study. Ethnicity was registered, and standardized radiographs of anteroposterior pelvic and Dunn views were obtained. Cam and pincer deformity, and acetabular dysplasia were quantified using the alpha angle, triangular index, and lateral center-edge angle (LCEA). Regression analyses with generalized estimating equations were used to determine prevalence differences in bony hip morphology.

RESULTS:

A total of 445 male soccer players (890 hips; mean age \pm SD, 25 \pm 4.9 years) participated in the study, representing the following ethnic groups: Arabic (59%), black (24%), Persian (7%), white (6%), East Asian (2%), and other (2%). The prevalence of cam deformity (alpha angle $>60^\circ$) ranged from 57.5% to 71.7% across 4 of the groups, but East Asians had a significantly lower prevalence (18.8%; $P \leq .032$). A large cam deformity (alpha angle $>78^\circ$) was more prevalent in white (33.3%) compared with black soccer players (17.8%; $P = .041$) and was absent in East Asian players. Pincer deformity (LCEA $>40^\circ$) was uncommon (3%) in all ethnicities. The prevalence of acetabular dysplasia (LCEA $<20^\circ$) ranged from 8.0% to 16.7%, apart from the white group, in which prevalence was only 1.9% ($P = .03$).

CONCLUSION:

The prevalence of a cam deformity and acetabular dysplasia differed between ethnicities in this cohort of professional male soccer players. These findings suggest that there may be ethnic differences in both acetabular morphology and femoral bony response to athletic load.

32 A. KNEE/ACL**Re-rupture**

Am J Sports Med. 2016 Nov;44(11):2827-2832. Epub 2016 Jul 7.

Exploring the High Reinjury Rate in Younger Patients Undergoing Anterior Cruciate Ligament Reconstruction.

Webster KE¹, Feller JA².

BACKGROUND:

Younger age is being increasingly recognized as a risk factor for anterior cruciate ligament (ACL) graft rupture and contralateral ACL injury after ACL reconstruction. Recent reports estimate second ACL injury rates to be in the range of 20% to 40%, which is a significant concern and requires further exploration.

PURPOSE:

The primary purpose was to determine the rates of graft rupture and injury to the contralateral native ACL in younger athletes. We also sought to explore the influence of sex and age groupings (<18 years vs 18-19 years at the time of surgery) on the risk of subsequent ACL injury.

STUDY DESIGN:

Cohort study; Level of evidence, 3.

METHODS:

The study cohort consisted of 354 consecutive patients who were younger than 20 years when they underwent their first primary hamstring tendon autograft ACL reconstruction. The number of subsequent ACL injuries (graft rupture or a contralateral injury to the native ACL) was determined at a mean follow-up of 5 years (range, 3-10 years). Subgroup analysis included sex and age (<18 years vs 18-19 years at the time of surgery) comparisons. Descriptive statistics were calculated for the timing of ACL graft rupture and contralateral ACL injury.

RESULTS:

The overall follow-up rate was 89% (316/354). Graft ruptures occurred in 57 patients (18%) at an average time of 1.8 years after surgery. Almost half (47%) occurred within the first postoperative year, and 74% occurred within the first 2 years. The highest graft rupture rate of 28.3% was in the youngest males (<18 years), and this was significantly higher than in females of the same age (12.9%), as well as in male patients older than 18 years (13.8%). Contralateral ACL injuries occurred in 56 patients (17.7%) at an average time of 3.7 years after surgery. There were no significant age- or sex-based differences for contralateral ACL injuries. The total number of patients who had at least 1 further ACL injury subsequent to the primary surgery was 110 (35%).

CONCLUSION:

The high rate of subsequent ACL injury in younger patients was confirmed. Early graft ruptures were more prevalent in patients who underwent surgery when they were younger than 18 years versus those in the 18- to 19-year age group. Males had higher rates of graft rupture than did females, with the youngest males (<18 years) at the highest risk in the investigated cohort.

Arthrolysis

Arthroscopy. 2016 Oct 24. pii: S0749-8063(16)30589-8. doi: 10.1016/j.arthro.2016.07.029.

Long-term Results of Arthroscopic Arthrolysis for Arthrofibrosis After Anterior Cruciate Ligament Reconstruction.

Mayr HO¹, Brandt CM², Weig T³, Koehne M⁴, Bernstein A⁵, Suedkamp NP⁵, Hube R⁴, Stoehr A⁴.

The current study was conducted to evaluate the long-term clinical and radiological outcomes after arthroscopic arthrolysis for arthrofibrosis after anterior cruciate ligament reconstruction (ACLR).

METHODS:

All patients treated with arthrolysis between 1990 and 1998 were included. Indication was arthrofibrosis in at least one knee compartment or a cyclops syndrome limiting range of motion (ROM) by $> 5^\circ$ of extension deficit and 15° of flexion deficit. International Knee Documentation Committee (IKDC) 2000 subjective and objective, Lysholm score, and x-ray evaluation were documented. Statistical analysis and power calculation were performed ($P < .05$).

RESULTS:

One hundred forty-one patients (follow-up, 71%) were examined at a mean of 18.7 ± 2.6 years after arthroscopic arthrolysis. Mean IKDC 2000 score was 79.49 ± 14.32 . IKDC objective was normal in 0%, nearly normal in 6%, abnormal in 56%, and severely abnormal in 38%. One hundred percent of patients showed more than grade II osteoarthritis. ROM improvement after arthrolysis did not change significantly compared with midterm results ($t = 4.5$ years). Patients with persisting motion deficits ($P = .02$) and after medial meniscus resection ($P < .001$) at time of ACLR showed significantly greater progression of osteoarthritis in comparison with patients without these additional disorders. In case of arthrolysis later than 1 year after ACLR, a more severe osteoarthritis grade (4% vs 20% grade III; $P = .038$) and a lower jump distance (IKDC: 61% A, 25% B vs 39% A, 41% B; $P = .028$) were obvious compared with patients who underwent arthrolysis within the first year after ACLR.

CONCLUSIONS:

Long-term motion improvement can be achieved by arthrolysis. Persistent loss of motion resulted in a higher degree of osteoarthritis in the study population. Early intervention seems advisable as patients with arthrolysis later than 1 year after index surgery reached worse IKDC objective grading.

LEVEL OF EVIDENCE:

Level IV, therapeutic case series

Outcomes post surgery for athletes

Arthroscopy. 2016 Oct 20. pii: S0749-8063(16)30593-X. doi: 10.1016/j.arthro.2016.08.012.

Comparative Influence of Sport Type on Outcome After Anterior Cruciate Ligament Reconstruction at Minimum 2-Year Follow-up.

Nwachukwu BU¹, Voleti PB², Chang B², Berkanish P², Mahony GT², Williams RJ Rd², Altchek DW², Allen AA².

PURPOSE:

To investigate differences between sport types for patient-reported outcome after anterior cruciate ligament reconstruction (ACLR).

METHODS:

Included patients were enrolled as part of a prospective institutional ACL registry. Inclusion criteria were preoperative self-identification as a competitive athlete, maximum score on the preoperative Marx Activity Scale, and minimum 2-year follow-up. Demographic, intraoperative, and outcome data were extracted from the registry. Outcome tools administered as part of the registry included International Knee Documentation Committee (IKDC), Lysholm-Tegner Scales, Marx Activity Scale (MAS), and 12-Item Short Form Health Survey (SF-12).

RESULTS:

A total of 294 patients with a mean age of 25.5 years (standard deviation 12.1) met the study inclusion criteria; mean follow-up was 3.7 years. Included sports categories were soccer (n = 92; 31.3%), skiing (n = 67; 22.8%), basketball (n = 56; 19.1%), lacrosse (n = 38; 12.9%), football (n = 29; 9.9%), and Tennis (n = 12; 4.1%). At baseline, compared with other sports, lacrosse players have higher outcome scores while skiers had lower scores. At 2-year follow-up, however, across all outcome tools, football players demonstrated significantly higher outcome scores than all other athletes (IKDC, 93.2, P = .001; Lysholm, 93.2, P = .03; MAS, 13.1, P = .03; SF-12 Mental Component Summary, 57.9, P = .0002). Conversely, at 2-year follow-up, soccer players demonstrated a significantly lower Lysholm (86.7, P = .02) and a trend toward lower IKDC (85.6, P = .09) scores.

CONCLUSIONS:

Patient-reported outcomes after ACLR among active athletes are comparable. Football players demonstrate quantitatively higher outcome scores whereas soccer players have lower scores. However, these outcome score differences may not be clinically significant and may be subject to confounding variables. Continued attention should be paid to understanding sport-specific outcome after ACLR.

LEVEL OF EVIDENCE: Level IV, therapeutic case series.

Neuroplasticity

Neuroplasticity Associated With Anterior Cruciate Ligament Reconstruction

Authors: Dustin R. Grooms, ^{1,2}, Stephen J. Page, ³, Deborah S. Nichols-Larsen, ³, Ajit M.W. Chaudhari, ³, Susan E. White, ³, James A. Onate, ³

Published: *Journal of Orthopaedic & Sports Physical Therapy*,
2016 **Volume:**0 **Issue:**0 **Pages:**1–27 **DOI:**10.2519/jospt.2017.7003

Study Design

Controlled laboratory study.

Background

Anterior cruciate ligament (ACL) injury may result in neuroplastic changes due to lost mechanoreceptors of the ACL and compensations in neuromuscular control. These alterations are not completely understood. Assessing brain function after ACL injury and reconstruction with functional magnetic resonance imaging (fMRI), provides a means to address this gap in knowledge.

Objective

To investigate brain activation differences during knee flexion/extension in persons who have undergone ACL reconstruction (ACLR) and matched controls.

Methods

Fifteen participants who had undergone left ACLR (38.13±27.16 months post-surgery) and 15 healthy controls matched on age, height, mass, extremity dominance, education level, sport participation, and physical activity level participated. fMRI data were obtained during a unilateral knee motor task consisting of repeated cycles of knee flexion and extension.

Results

Participants with ACLR had increased activation in the contralateral motor cortex, lingual gyrus, and ipsilateral secondary somatosensory area and diminished activation in the ipsilateral motor cortex and cerebellum when compared to healthy matched controls.

Conclusion

Brain activation for knee flexion-extension motion may be altered following ACLR. The ACLR brain activation profile may indicate a shift towards a visual-motor strategy as opposed to sensory-motor strategy to engage in knee movement. *J Orthop Sports Phys Ther*, Epub 5 Nov 2016. doi:10.2519/jospt.2017.7003

Level of Evidence

Cohort, level 3. *J Orthop Sports Phys Ther*, Epub 5 Nov 2016. doi:10.2519/jospt.2017.7003

Keyword: brain, knee, motor control, neuromuscular control, neuroscience, rehabilitation, sports injury

34. PATELLA

Lunges and stress

Trunk and Shank Position Influences Patellofemoral Joint Stress of the Lead and Trail Limb During the Forward Lunge Exercise

Authors: Cory L. Hofmann, MS¹, Derek T. Holyoak, ², Paul M. Juris, EdD^{1,3}

Published: *Journal of Orthopaedic & Sports Physical Therapy*,
2016 **Volume:**0 **Issue:**0 **Pages:**1–29 **DOI:**10.2519/jospt.2017.6336

Study Design

Controlled laboratory study; Repeated measures design.

Background

The effects of trunk and shank position on patellofemoral joint stress of the lead limb has been well studied, however the effects on the trail limb are not well understood.

Objectives

To test the hypothesis that trunk and shank position influence patellofemoral joint stress of both limbs during the forward lunge exercise.

Methods

Patellofemoral kinetics were quantified from 18 healthy participants performing the lunge exercise with different combinations of trunk and shank position (vertical or forward). A 2 x 3 (limb x lunge variation) repeated measures ANOVA was performed with paired T-tests for post hoc comparisons.

Results

The trail limb experienced greater total patellofemoral joint stress relative to the lead limb, regardless of trunk and shank position ($P < 0.0001$). The lunge variation with a vertical shank position resulted in significantly greater peak patellofemoral joint stress in the trail limb relative to the lead limb ($P < 0.0001$). A forward trunk and shank position resulted in the highest patellofemoral stress in the lead limb ($P < 0.0001$).

Conclusion

Trunk and shank position have a significant influence on patellofemoral joint loading of both limbs during the forward lunge, with the trail limb generally experiencing greater total joint stress. Restricting forward translation of the lead limb shank reduces patellofemoral joint stress at the expense of increased stress in the trail limb. Technique recommendations should consider the demands imposed upon both knees during this exercise. *J Orthop Sports Phys Ther, Epub 4 Nov 2016. doi:10.2519/jospt.2017.6336*

Keyword: joint moments, knee mechanics, lower extremity, patellofemoral compression, strength training

35. KNEE/TOTAL

High verse low intensity ex. Equal

Early high-intensity versus low-intensity rehabilitation after total knee arthroplasty: A randomized controlled trial

Arthritis Care & Research , 11/07/2016

Bade M, et al.

This study was carried out to assess the safety and adequacy of a high-intensity progressive rehabilitation protocol (HI) beginning 4 days after total knee arthroplasty (TKA) compared to a low-intensity (LI) rehabilitation protocol. The results showed that both the HI and LI interventions were effective in improving strength and function after TKA. High-intensity progressive rehabilitation is safe for individuals after TKA. Despite, its effectiveness may be limited by arthrogenic muscular inhibition in the early postoperative period.

37. OSTEOARTHRITIS/KNEE**Hyaluronic acid**

Adv Ther. 2016 Nov 3.

Potential Impact of Biologically Derived Hyaluronic Acid on Quality of Life in Patients with Knee Osteoarthritis in the United States.

Rosen J^{1,2}, Sancheti P³, Fierlinger A⁴, Niazi F⁴, Johal H⁵, Bedi A⁶.

INTRODUCTION:

Knee osteoarthritis is one of the leading causes of disability in the world. Intra-articular hyaluronic acid (IA-HA) is a treatment modality that provides a minimally invasive treatment option for the management of osteoarthritis-related symptoms. This study examined the current and potential economic impact of using a biologically derived, high molecular weight hyaluronic acid preparation (Euflexxa) on the US population for the management of knee osteoarthritis.

METHODS:

A model was developed to estimate the total number of patients with symptomatic knee osteoarthritis in the US in 2015, distributed by Kellgren-Lawrence (K-L) grade, and the number of people living with total knee arthroplasty (TKA). The potential utility of Euflexxa was applied to this model population to determine the current and potential impact of the treatment as the total number of quality adjusted life years (QALY) saved within the US population.

RESULTS:

There are approximately 12 million people currently suffering from symptomatic knee osteoarthritis in the US, and approximately 5 million living with TKA. It was estimated that, with a target treatment group of K-L grades 2-3, there are approximately 4 million patients eligible for treatment with a high molecular weight intra-articular hyaluronic acid injection. With current use, it is estimated that Euflexxa can save 36,730 QALY/year among the US population, and has the potential to save an additional 369,181 QALY/year if used by all eligible patients.

CONCLUSIONS:

This study demonstrates that more widely used, biologically derived, high molecular weight IA-HAs, such as Euflexxa, have the potential to save a substantial number of QALYs among the US population with symptomatic knee osteoarthritis.

Cartilage defects

Arthritis Rheumatol. 2016 Oct 27. doi: 10.1002/art.39970.

Partial- and Full-thickness focal cartilage defects equally contribute to development of new cartilage damage in knee osteoarthritis - the Multicenter Osteoarthritis Study.

Guermazi A¹, Hayashi D², Roemer FW^{2,3}, Niu J⁴, Quinn EK⁴, Crema MD², Nevitt MC⁵, Torner J⁶, Lewis CE⁷, Felson DT⁴.

OBJECTIVES:

To determine the risk of incident cartilage damage in unaffected subregions when one tibiofemoral compartment has a full-thickness vs. partial-thickness focal defects in knees with and without radiographic osteoarthritis.

METHODS:

The Multicenter Osteoarthritis Study participants with semiquantitative MRI readings at baseline and 30-month were included. We estimated the risk of incident cartilage defects developing in tibiofemoral compartments with prevalent partial-thickness and full-thickness cartilage defects in a subregion within the compartment, using tibiofemoral compartments with no baseline cartilage defects as reference. Logistic regression with generalized estimating equations was used for all analyses with adjustments for confounders.

RESULTS:

374 compartments (359 knees) were included, of which 140 knees (39%) had radiographic osteoarthritis. Compared to compartments with no baseline cartilage defects, those with partial-thickness (aOR 1.62, 95%CI 1.06-2.47) and full-thickness cartilage defects (aOR 1.92, 95%CI 1.00-3.66) in a subregion had higher risk for incident cartilage defects in other subregions in the same compartment.

CONCLUSIONS:

Prevalent focal cartilage defects, regardless of defect depth, in a single subregion within a tibiofemoral joint compartment increase the risk for development of new cartilage damage in other subregions of the same tibiofemoral joint compartment for middle-aged to elderly persons with or at high risk of knee osteoarthritis. This article is protected by copyright. All rights reserved.

CS Helps

Arthritis Res Ther. 2016 Nov 3;18(1):256.

Chondroitin sulfate efficacy versus celecoxib on knee osteoarthritis structural changes using magnetic resonance imaging: a 2-year multicentre exploratory study.

Pelletier JP¹, Raynauld JP^{2,3}, Beaulieu AD⁴, Bessette L⁵, Morin F⁶, de Brum-Fernandes AJ⁷, Delorme P⁸, Dorais M⁹, Paiement P⁸, Abram F⁸, Martel-Pelletier J².

BACKGROUND:

In osteoarthritis (OA) treatment, although chondroitin sulfate (CS) was found in a number of studies using radiography to have a structure-modifying effect, to date CS use is still under debate. A clinical study using quantitative magnetic resonance imaging (qMRI) is therefore of the utmost importance. Here we report data from a 24-month, randomised, double-blind, double-dummy, controlled, comparative exploratory study of knee OA. The primary endpoint was to determine the effect of CS 1200 mg/day versus celecoxib 200 mg/day on cartilage volume loss (CVL) in the lateral compartment over time as measured by qMRI. Secondary endpoints included assessment of the OA structural changes and signs and symptoms of OA.

METHODS:

qMRI was performed at baseline and at 12 and 24 months. CVL, bone marrow lesion size, and synovial thickness were evaluated using qMRI. The primary statistical analysis was carried out on the modified intention-to-treat (mITT) population (n = 138) using chi-squared, Fisher's exact, Wilcoxon Mann-Whitney, and Student's t tests and analysis of covariance. Analyses were also conducted on the according-to-protocol (ATP; n = 120) population.

RESULTS:

In the adjusted mITT analysis, compared with celecoxib treatment, patients treated with CS had a significant reduced CVL at 24 months in the medial compartment (celecoxib -8.1 % ± 4.2, CS -6.3 % ± 3.2; p = 0.018) and medial condyle (-7.7 % ± 4.7, -5.5 % ± 3.9; p = 0.008); no significant effect was seen in the lateral compartment. In the ATP population, CS reduced CVL in the medial compartment at 12 months (celecoxib -5.6 % ± 3.0, CS -4.5 % ± 2.6; p = 0.049) and 24 months (celecoxib -8.4 % ± 4.2, CS -6.6 % ± 3.3; p = 0.021), and in the medial condyle at 24 months (celecoxib -8.1 % ± 4.7, CS -5.7 % ± 4.0; p = 0.010). A trend towards a statistically reduced synovial thickness (celecoxib +17.96 ± 33.73 mm, CS -0.66 ± 22.72 mm; p = 0.076) in the medial suprapatellar bursa was observed in CS patients. Both groups experienced a marked reduction in the incidence of patients with joint swelling/effusion and in symptoms over time. Data showed similar good safety profiles including cardiovascular adverse events for both drugs.

CONCLUSION:

This study demonstrated, for the first time in a 2-year randomised controlled trial using qMRI, the superiority of CS over celecoxib at reducing CVL in knee OA patients.

40. ANKLE SPRAINS AND INSTABILITY

Postural control

Assessment of Relationships Between Joint Motion Quality and Postural Control in Patients With Chronic Ankle Joint Instability

Authors: Dawid Bączkiewicz, PhD¹, Krzysztof Falkowski, MD², Edyta Majorczyk, PhD^{1,3}

Published: *Journal of Orthopaedic & Sports Physical Therapy*,
2016 **Volume:**0 **Issue:**0 **Pages:**1–26 **DOI:**10.2519/jospt.2017.6836

Study Design

Controlled laboratory study, cross sectional.

Background

Lateral ankle sprains are among the most common injuries encountered during athletic participation. Following the initial injury there is an alarmingly high risk of re-injury and development of chronic ankle instability (CAI), which is dependent on a combination of factors, including sensorimotor deficits and changes in the biomechanical environment of the ankle joint.

Objective

To evaluate CAI-related disturbances in arthrokinematic motion quality and postural control and the relationships between them.

Methods

Sixty-three male subjects (31 with CAI and 32 healthy controls) were enrolled in the study. For arthrokinematic motion quality analysis, the vibroarthrographic signals were collected during ankle flexion/extension motion using an acceleration sensor and described by variability (VMS), amplitude (R4) and frequency (P1 and P2) parameters. Using the Biodex Balance System, single leg dynamic balance was measured by overall (OSI), anteroposterior (APSI), and mediolateral (MLSI) stability indices.

Results

In the CAI group values of vibroarthrographic parameters (VMS, R4, P1 and P2) were significantly higher than in the controls ($p < 0.01$). Similar results were obtained for all postural control parameters (OSI, APSI, MLSI; $p < 0.05$). Moreover, correlations between OSI and VMS, P1 and P2, as well as APSI and P1 and P2 were observed in the CAI patient group but not in controls.

Conclusions

In patients with CAI, deficits in both quality of ankle arthrokinematic motion and postural control was present. Therefore physical therapy interventions focused on improving ankle neuromuscular control and arthrokinematic function are necessary in CAI patient care. *J Orthop Sports Phys Ther*, Epub 4 Nov 2016. doi:10.2519/jospt.2017.6836

Keyword: arthrokinematics, balance/postural stability, crepitus, lateral ankle sprain, vibroarthrography

41 A. ACHILLES TENDON AND CALF**Reduced two point discrimination****Disrupted Tactile Acuity in People With Achilles Tendinopathy: A Preliminary Case-Control Investigation**

Authors: James Debenham, PT¹, Prue Butler, PT², Adrian Mallows, PT³, Benedict M. Wand, PT, PhD¹

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:**0 **Issue:**0 **Pages:**1–10 **DOI:**10.2519/jospt.2016.6514

Study Design

Controlled laboratory study, preliminary case-control design.

Background

The mechanisms contributing to the problem of Achilles tendinopathy remain poorly understood. The disparity between pain experience and peripheral pathology demonstrated in patients with Achilles tendinopathy opens the door to the possibility that changes in central nervous system function may be involved.

Objectives

To investigate if lower limb tactile acuity is impaired in people with non-acute Achilles tendinopathy.

Methods

Thirteen consecutive participants with non-acute mid-portion Achilles tendinopathy and thirteen healthy controls were enrolled. Two point discrimination thresholds over the affected Achilles tendon, unaffected tendon and over the tendon of healthy controls were evaluated. Independent and dependent t-tests were used to compare group means.

Results

Two-point discrimination distance over the affected limb in participants with Achilles tendinopathy was significantly increased when compared to the unaffected limb (mean difference, 11.7mm, 95% CI: 1.9 - 21.5, $P = 0.02$) and to healthy controls (mean difference, 13.1mm, 95% CI: 1.6 - 24.6, $P = 0.03$). There was no significant difference between the healthy controls and the unaffected side in people with Achilles tendinopathy (mean difference, 1.4mm 95%CI:-7.9-5.1, $P = 0.66$).

Conclusions

These data provide the first evidence of reduced two-point discrimination over the affected tendon in patients with Achilles tendinopathy. Further research is needed to determine the cause for the change in tactile acuity. *J Orthop Sports Phys Ther*, Epub 30 Oct 2016. doi:10.2519/jospt.2016.6514

Keyword: Achilles tendon, tactile acuity, tendinopathy, two point discrimination

44. RHUMATOID ARTHRITIS**Smoking worsens AS**

Rheumatol Int. 2016 Nov 4.

Increasing smoking intensity is associated with increased disease activity in axial spondyloarthritis.

Zhao S^{1,2}, Challoner B¹, Khattak M², Moots RJ^{1,2}, Goodson NJ^{3,4}.

A history of ever-smoking appears to be associated with a more severe disease phenotype in axial spondyloarthritis (axSpA). However, evidence is sparse for the effect of increased smoking exposure on disease outcomes or whether smoking reduction or cessation improves outcomes.

The aim of this study was to explore whether a dose-response relationship exists between pack-years and disease activity and functional impairment in axSpA. Consecutive patients meeting ASAS criteria for axial SpA were recruited from a spondyloarthritis service.

The associations between pack-years of smoking and: (1) disease activity (BASDAI/ASDAS), (2) spinal pain, (3) functional impairment (BASFI) and (4) inflammatory markers were explored using multivariable linear models, adjusted for age, gender and use of TNF inhibition (TNFi) therapy. Pack-years were categorised into four groups (<10, 11-20, 21-40, >40) and analysed with light smoking (<10) as reference. Two hundred and thirty-eight axSpA patients were recruited: 76% were male, mean age 46.4 years (SD ± 13.7), and 33% were treated with TNFi.

One hundred and twelve patients reported history of ever-smoking with median pack-year 20 [IQR10-30]. Compared to light smokers, those with higher categories of smoking exposures had higher BASDAI (21-40 pack-years, $\beta = 1.6$ (95% CI 0.28, 2.95); >40, $\beta = 2.6$ (0.54, 3.56)), higher BASFI (21-40, $\beta = 2.1$ (0.42, 4.80); >40, $\beta = 3.2$ (0.76, 5.71)), and higher ASDAS (21-40, $\beta = 0.82$ (0.14, 1.51)).

This cross-sectional study demonstrated that smoking is associated with increased axSpA severity markers in a dose-response manner. Particular effort should be made to restrict smoking exposure early before accruing a significant number of pack-years

Lung involvement

Curr Rheumatol Rep. 2016 Nov;18(11):69.

The Complex Role of the Lung in the Pathogenesis and Clinical Outcomes of Rheumatoid Arthritis.

Kelmenson LB¹, Demoruelle MK², Deane KD^{2,3}.

While the primary manifestation of rheumatoid arthritis (RA) is articular disease, extra-articular disease may also occur. In particular, pulmonary disease is a frequent extra-articular manifestation of seropositive RA and a leading cause of morbidity and mortality in this population.

This review will highlight studies published in the last several years and will, in particular, discuss the relationship of antibodies to citrullinated protein/peptide antigens (ACPA) and lung disease in patients with RA. We will also review the data regarding the potential role of the lung and generation of RA-related autoantibodies in a period of disease development termed "preclinical RA." Finally, we will discuss the role of ACPA and other Abs in non-RA pulmonary diseases and discuss a research agenda for next steps in the understanding and management of the lung in RA

Glucocorticoids

Arthritis Res Ther. 2016 Nov 5;18(1):258.

Glucocorticoids and endothelial function in inflammatory diseases: focus on rheumatoid arthritis.

Verhoeven F^{1,2}, Prati C^{1,2}, Maguin-Gaté K¹, Wendling D^{2,3}, Demougeot C⁴.

Rheumatoid arthritis (RA) is the most common systemic autoimmune disease characterized by articular and extra-articular manifestations involving cardiovascular (CV) diseases.

RA increases the CV mortality by up to 50 % compared with the global population and CV disease is the leading cause of death in patients with RA. There is growing evidence that RA favors accelerated atherogenesis secondary to endothelial dysfunction (ED) that occurs early in the course of the disease. ED is a functional and reversible alteration of endothelial cells, leading to a shift of the actions of the endothelium towards reduced vasodilation, proinflammatory state, proliferative and prothrombotic properties.

The mechanistic links between RA and ED have not been fully explained, but growing evidence suggests a role for traditional CV factors, auto-antibodies, genetic factors, oxidative stress, inflammation and iatrogenic interventions such as glucocorticoids (GCs) use. GCs have been used in RA for several decades. Whilst their deleterious CV side effects were described in the 1950s, their effect on CV risk associated with inflammatory arthritis remains subject for debate. GC might induce negative effects on endothelial function, via a direct effect on endothelium or via increasing CV risk factors. Conversely, they might actually improve endothelial function by decreasing systemic and/or vascular inflammation.

The present review summarizes the available data on the impact of GCs on endothelial function, both in normal and inflammatory conditions, with a special focus on RA patients.

46 B. LOWER LIMB NEUROMOILIZATION

ACNES entrapment

Treatment response and central pain processing in Anterior Cutaneous Nerve Entrapment Syndrome: An explorative study

Dagmar C. van Rijckevorsel Oliver B. Boelens Rudi M. Roumen Oliver H. Wilder-Smith Harry van Goor DOI: <http://dx.doi.org/10.1016/j.sjpain.2016.09.014>

Highlights

- Chronic pain in ACNES may be more than just a localized problem.
- ACNES patients refractory to treatment show signs of generalized hyperalgesia.
- Refractory ACNES patients suffered from a longer duration of pain before treatment.
- Local treatment failure may be related to sensitized central pain processing.

Background 10–30% of chronic abdominal pain originates in the abdominal wall. A common cause for chronic abdominal wall pain is the Anterior Cutaneous Nerve Entrapment Syndrome (ACNES), in which an intercostal nerve branch is entrapped in the abdominal rectus sheath. Treatment consists of local anaesthetics and neurectomy, and is ineffective in 25% of cases for yet unknown reasons. In some conditions, chronic pain is the result of altered pain processing. This so-called sensitization can manifest as segmental or even generalized hyperalgesia, and is generally difficult to treat. **Objective** The aim of this study was to assess pain processing in ACNES patients responsive and refractory to treatment by using Quantitative Sensory Testing, in order to explore whether signs of altered central pain processing are present in ACNES and are a possible explanation for poor treatment outcomes. **Methods** 50 patients treated for ACNES with locally orientated treatment were included. They were allocated to a responsive or refractory group based on their response to treatment. Patients showing an improvement of the Visual Analogue Scale (VAS) pain score combined with a current absolute VAS of <40 mm were scored as responsive. Sensation and pain thresholds to pressure and electric skin stimulation were determined in the paravertebral bilateral ACNES dermatomes and at four control areas on the non-dominant side of the body, i.e. the musculus trapezius pars medialis, musculus rectus femoris, musculus abductor hallucis and the thenar. The ACNES dermatomes were chosen to signal segmental hyperalgesia and the sum of the control areas together as a reflection of generalized hyperalgesia. Lower thresholds were interpreted as signs of sensitized pain processing. To test for alterations in endogenous pain inhibition, a conditioned pain modulation (CPM) response to a cold pressor task was determined. Also, patients filled in three pain-related questionnaires, to evaluate possible influence of psychological characteristics on the experienced pain.

Results Patients refractory to treatment showed significantly lower pressure pain thresholds in the ACNES dermatomes and for the sum of as well as in two individual control areas. No differences were found between groups for electric thresholds or CPM response. Duration of complaints before diagnosis and treatment was significantly longer in the refractory compared to the responsive group, and refractory patients scored higher on the pain-related psychological surveys.

Conclusion and Implications In this hypothesis-generating exploratory study, ACNES patients refractory to treatment showed more signs of sensitized segmental and central pain processing. A longer duration of complaints before diagnosis and treatment may be related to these alterations in pain processing, and both findings could be associated with less effective locally orientated treatment. In order to validate these hypotheses further research is needed.

48 C. MUSCLES

Hamstring tears not related to length

Am J Sports Med. 2016 Aug 31. pii: 0363546516664162.

No Relationship Between Hamstring Flexibility and Hamstring Injuries in Male Amateur Soccer Players: A Prospective Study.

van Doormaal MC1, van der Horst N1, Backx FJ1, Smits DW1, Huisstede BM2.

BACKGROUND:

In soccer, although **hamstring flexibility** is thought to play a major role in preventing **hamstring injuries**, the **relationship** between **hamstring flexibility** and **hamstring injuries** remains

unclear.

PURPOSE:

To investigate the **relationship** between **hamstring flexibility** and **hamstring injuries** in **male amateur soccer players**.

STUDY DESIGN:

Case-control **study**; Level of evidence, 3.

METHODS:

This **study** included 450 **male** first-class **amateur soccer players** (mean age, 24.5 years).

Hamstring flexibility was measured by performing the sit-and-reach test (SRT). The **relationship** between **hamstring flexibility** and the occurrence of **hamstring injuries** in the following year, while adjusting for the possible confounding effects of age and previous **hamstring injuries**, was determined with a multivariate logistic regression analysis.

RESULTS:

Of the 450 **soccer players**, 21.8% reported a **hamstring** injury in the previous year. The mean (\pm SD) baseline score for the SRT was 21.2 ± 9.2 cm. During the 1-year follow-up period, 23 participants (5.1%) suffered a **hamstring** injury. In the multivariate analysis, while adjusting for age and previous **injuries**, no significant **relationship** was found between **hamstring flexibility** and **hamstring injuries** ($P = .493$).

CONCLUSION:

In this group of **soccer players**, **hamstring flexibility** (measured with the SRT) was not related to **hamstring injuries**. Age and previous **hamstring injuries** as possible confounders did not appear to influence this **relationship**. Other etiological factors need to be examined to further elucidate the mechanism of **hamstring injuries**.

Musculotendinous junction

Scand J Med Sci Sports. 2016 Oct 26. doi: 10.1111/sms.12794.

Composition and adaptation of human myotendinous junction and neighboring muscle fibers to heavy resistance training.

Jakobsen JR1, Mackey AL2,3, Knudsen AB1, Koch M4, Kjaer M5, Krogsgaard MR1.

The **myotendinous junction** (MTJ) is a common site of strain injury and yet understanding of its **composition** and ability to adapt to loading is poor.

The main aims of this study were to determine the profile of selected collagens and macrophage density in **human** MTJ and adjoining **muscle fibers**, and to investigate whether **heavy** exercise

loading would alter this profile. Fifteen individuals scheduled for anterior cruciate ligament repair surgery were randomized into three groups: control, acute or 4 weeks **heavy resistance training**. MTJ samples were collected from the semitendinosus and gracilis **muscles** and were sectioned and stained immunohistochemically for collagen types I, III, VI, XII, XIV, XXII, Tenascin-C and CD68. Macrophage density and distribution was evaluated and the amount of each collagen type in **muscle** and MTJ was graded. Collagen XXII was observed solely at the MTJ, while all other collagens were abundant at the MTJ and in **muscle** perimysium or endomysium. The endomysial content of collagen XIV, macrophages and Tenascin-C increased following 4 weeks of **training**.

These findings illustrate the heterogeneity of collagen type **composition** of **human** MTJ. The increase in collagen XIV following 4 weeks of **training** may reflect a **training**-induced protection against strain injuries in this region.

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KEYWORDS: Injury prevention; Nordic Hamstring; extracellular matrix

51. CFS/BET

Education and LBP

Occup Med (Lond). 2016 Jul 18. pii: kqw072

Effectiveness of educational materials to prevent occupational low back pain.

Shorthouse FM¹, Roffi V², Tack C².

BACKGROUND:

Low back pain (LBP) in association with occupation is well documented. A subpopulation of workers can be defined as 'non-heavy' manual workers with either light or sedentary roles who may be at risk of LBP due to insufficient physical activity. Educational materials are a potential intervention, which are cost-effective and easily targeted at this population.

AIMS:

To investigate the evidence for using information material among 'non-heavy' manual workers and the effect on their sickness absence.

METHODS:

A search investigating the effect of educational material on LBP in non-heavy manual workers. Electronic databases were searched and selected references were reviewed. Specific key terms were used including: 'worker', 'non-heavy manual', 'booklet', 'leaflet', 'advice', 'sickness', 'absenteeism', 'prevention' and 'low back pain'. Methodological quality was assessed by predefined criteria.

RESULTS:

Four studies were identified: one guideline review, one prospective study and two randomized controlled trials. Methodological quality was deemed moderate to high. There was insufficient evidence to show written education altered sickness absence. There was evidence that information given to workers can help change attitudes and beliefs about LBP.

CONCLUSIONS:

Educational materials alone do not appear to reduce sickness absence for LBP in the 'non-heavy' manual working population. However, they can facilitate behavioural change and modify health beliefs and attitudes. Educational materials may be a useful medium to engage workers, provide information regarding practical modifications to their work environment and activities and potentially reduce psychological distress regarding ill-health at work.

Repeated motions

BMC Musculoskelet Disord. 2016 Nov 3;17(1):453.

Low back pain patterns over one year among 842 workers in the DPhacto study and predictors for chronicity based on repetitive measurements.

Lagersted-Olsen J^{1,2}, Bay H¹, Jørgensen MB¹, Holtermann A^{1,2}, Sjøgaard K³.

BACKGROUND:

Low back pain (LBP) occurrence and intensity are considered to fluctuate over time, requiring frequent repetitive assessments to capture its true time pattern. Text messages makes frequent reporting of LBP feasible, which enables investigation of 1) the time pattern of LBP, and 2) predictors for having a continued high (chronic) level of LBP over longer periods of time. However, this has not previously been investigated in a larger working population. The aim of

this study was to examine these two aspects in a working population of 842 workers with repetitive measurements of LBP over one year.

METHODS:

There were 842 workers from 15 companies in the DPhacto study participating in this study. Demographic, work- and health-related factors, and back endurance were measured at baseline, while 14 monthly repeated text message assessments of LBP intensity were prospectively collected. A factor analysis was used to cluster different time-patterns of LBP, and defining the group of participants with chronic LBP. A multi-adjusted logistic regression analysis was performed to investigate baseline predictors for chronic LBP.

RESULTS:

The factor analysis revealed two dimensions of the time pattern of LBP, defined as the LBP intensity and LBP variation, respectively. A Visual Pain Mapping was formed based on the combination of the two pain dimensions, classifying the time-patterns of LBP into four categories: (1) low intensity and low variation, (2) low intensity and high variation, (3) high intensity and high variation, (4) high intensity and low variation (defined as chronic LBP). Significant baseline predictors for chronic LBP in the fully adjusted model were high baseline LBP ($p < 0.01$), low workability ($p < 0.01$), low BMI ($p < 0.05$), and being a blue-collar worker (vs. white-collar worker) ($p < 0.05$).

CONCLUSION:

This study presents a novel classification of the course of LBP based on repetitive measurements over a year, and revealed the predicting factors for chronic LBP based on repetitive measurements in a working population.

53. CORE

Psoas and quadratus ex

Evaluation of Psoas Major and Quadratus Lumborum Recruitment Using Diffusion-Weighted Imaging Before and After Five Trunk Exercises

Published: *Journal of Orthopaedic & Sports Physical Therapy*,
2016 **Volume:**0 **Issue:**0 **Pages:**1–25 **DOI:**10.2519/jospt.2017.6730

Study Design

Controlled laboratory study; pre-test post-test.

Background

Diffusion-weighted (DW) imaging is a non-invasive magnetic resonance imaging technique that can be used to assess the recruitment of the psoas major (PM) and quadratus lumborum (QL). The recruitment of these muscles during trunk exercises has not been evaluated.

Objective

To evaluate the diffusion of water movement in several trunk muscles using diffusion-weighted (DW) imaging before and after specific trunk exercises in order to understand the level of recruitment of each muscle during each exercise.

Methods

Nine healthy male participants performed the right side bridge, knee raise, and three front bridges, including the hand-knee, elbow-knee, and elbow-toe. DW imaging was performed before and after each exercise. After scanning, the apparent diffusion coefficient (ADC) map was constructed, and ADC values of the rectus abdominis (RA), lateral abdominal muscles, QL, PM, and back muscles were calculated.

Results

The ADC value of the right PM, after the elbow-toe, demonstrated the largest increase, and was significant greater change than that of the hand-knee ($P < .001$) and side bridge ($P = .002$). For the right QL, the ADC change of the side bridge was significantly larger than that of other exercises ($P < .008$).

Conclusion

Of the 5 exercises investigated, the elbow-toe and side bridge elicit the greatest recruitment of the PM and QL, respectively. *J Orthop Sports Phys Ther, Epub 5 Nov 2016.*
doi:10.2519/jospt.2017.6730

Keyword: core, magnetic resonance imaging (MRI) research, muscle activity, stabilization exercise, trunk muscle

56. ATHLETICS

Postural changes in swimmers

Am J Sports Med. 2016 Oct 18. pii: 0363546516669506.

Effect of Swim Training on the Physical Characteristics of Competitive Adolescent Swimmers.

Hibberd EE¹, Laudner KG², Kucera KL³, Berkoff DJ³, Yu B³, Myers JB⁴.

BACKGROUND:

Subacromial space distance and forward head and shoulder posture are common characteristics resulting from swim training. These alterations can cause abnormal scapular kinematics and positioning, potentially increasing compression of structures in the subacromial space and increasing the risk for the development of swimmer's shoulder.

PURPOSE:

To evaluate the effect of the swim training season on subacromial space distance and forward head and forward shoulder posture as well as to determine the relationship between these variables.

STUDY DESIGN:

Cohort study; Level of evidence, 2.

METHODS:

Included in the study were 43 competitive adolescent swimmers and 29 nonoverhead adolescent athletes (controls) who were not currently experiencing any shoulder, neck, or back pain that limited their participation in sports activity. All participants were evaluated 3 times: once before the start of the swim training season and then at 2 follow-up sessions 6 and 12 weeks after the initial testing session. At each testing session, each participant completed a physical examination that included evaluation of posture and subacromial space distance.

RESULTS:

Swimmers had significantly greater decreases in subacromial space distance during the training season compared with nonoverhead athletes. Swimmers also demonstrated significantly greater increases in forward shoulder posture compared with nonoverhead athletes. A significant relationship was noted between changes in forward shoulder posture and changes in subacromial space distance from the baseline testing session to the assessment 6 weeks after baseline assessment. As forward shoulder posture increased, subacromial space significantly decreased.

CONCLUSION:

Because of their training load, swimmers experience a decrease in subacromial space distance and an increase in forward shoulder posture over the course of 12 weeks of training, potentially making these athletes more vulnerable to the development of shoulder pain and injury

59. PAIN

Chronic pain in the young

The Impact of Pain Catastrophizing on Outcomes: A Developmental Perspective across Children, Adolescents and Young Adults with Chronic Pain

Amanda B. Feinstein, Ph.D John A. Sturgeon, Ph.D. Rashmi P. Bhandari, Ph.D.
Ashley Dunn, M.P.H. Tom Rico, B.S. Ming C. Kao, Ph.D., M.D. Beth D. Darnall, Ph.D.

DOI: <http://dx.doi.org/10.1016/j.jpain.2016.10.009>

Highlights

- •Developmental differences in catastrophizing were explored in chronic pain patients
- •Age moderated the relation between pain catastrophizing and pain interference
- •The effect of catastrophizing on pain interference was strongest in adolescents

- •Psychosocial interventions should be optimized based on age and developmental level

Abstract

Pain catastrophizing is one of the most powerful predictors of poor outcomes in youth and adults with pain; however, little is known about differential impacts of pain catastrophizing on outcomes as a function of age. The current study examined the predictive value of pain catastrophizing on pain interference and pain intensity across children, adolescents, and two age groups of young adults with chronic pain. Cross-sectional data are presented from the adult and pediatric Collaborative Health Outcomes Information Registry (CHOIR), including measures of pain catastrophizing, pain intensity, pain interference and emotional distress from 1028 individuals with chronic pain. Results revealed that age moderated the relation between pain catastrophizing and pain interference, with the strength of these effects declining with age. The effect of pain catastrophizing on pain interference was strongest in adolescents and relatively weak in all three other groups. Emotional distress was the strongest predictor of pain interference for children, whereas pain intensity was the strongest predictor for both adult groups. Pain catastrophizing was found to predict pain intensity and, although age was a significant moderator, statistical findings were weak. Developmental considerations and clinical implications regarding the utility of the construct of pain catastrophizing across age groups are discussed.

Perspective

This article explores differences in pain catastrophizing as predictors of pain interference and pain intensity across cohorts of children, adolescents, and two age groups of young adults. This work may stimulate further research on chronic pain from a developmental perspective and inform developmentally tailored treatment interventions that target catastrophizing, emotional distress and pain intensity.

Glial cells and pain

Pain is not just a matter of nerves

Medical University of Vienna News, 11/14/2016

Pain-initiating function of glial cells identified for the first time.

The sensation of pain occurs when neural pathways conduct excitation generated by tissue damage to the spinal cord, where the nociceptive information is extensively pre-processed. From there, the information is transmitted to the human brain, where the sensation of "pain" is finally created. This is the general belief. However, researchers from the Division of Neurophysiology at MedUni Vienna's Center for Brain Research have now discovered that pain is not just a matter of nerves but that non-neuronal cells, the glial cells, are also involved in clinically relevant pain models and their activation is sufficient to amplify pain.

Phantom limb pain

Nat Commun. 2016 Oct 27;7:13209. doi: 10.1038/ncomms13209.

Induced sensorimotor brain plasticity controls pain in phantom limb patients.

Yanagisawa T^{1,2,3,4,5,6}, Fukuma R^{1,3,4,7}, Seymour B^{8,9}, Hosomi K^{1,10}, Kishima H¹, Shimizu T^{1,10}, Yokoi H¹¹, Hirata M^{1,4,6}, Yoshimine T^{1,4,6}, Kamitani Y^{3,7,12}, Saitoh Y^{1,10}.

The cause of pain in a phantom limb after partial or complete deafferentation is an important problem.

A popular but increasingly controversial theory is that it results from maladaptive reorganization of the sensorimotor cortex, suggesting that experimental induction of further reorganization should affect the pain, especially if it results in functional restoration.

Here we use a brain-machine interface (BMI) based on real-time magnetoencephalography signals to reconstruct affected hand movements with a robotic hand. BMI training induces significant plasticity in the sensorimotor cortex, manifested as improved discriminability of movement information and enhanced prosthetic control.

Contrary to our expectation that functional restoration would reduce pain, the BMI training with the phantom hand intensifies the pain. In contrast, BMI training designed to dissociate the prosthetic and phantom hands actually reduces pain. These results reveal a functional relevance between sensorimotor cortical plasticity and pain, and may provide a novel treatment with BMI neurofeedback.

60. COMPLEX REGIONAL PAIN

Basal Ganglia

Eur J Pain. 2016 Nov 2. doi: 10.1002/ejp.975.

Basal ganglia dysfunction in complex regional pain syndrome - A valid hypothesis?

Azqueta-Gavaldon M^{1,2}, Schulte-Göcking H^{3,4}, Storz C⁴, Azad S^{3,5}, Reiners A⁶, Borsook D⁷, Becerra L⁷, Kraft E^{3,4}.

Complex regional pain syndrome (CRPS) is a poorly understood pain disorder of the limbs.

Maladaptive cortical plasticity has been shown to play a major role in its pathophysiological presentation. Recently, there is increasing interest in the role of the basal ganglia (BG), since clinical findings and neuroimaging studies point to possible BG involvement in CRPS. CRPS

symptoms are often characterized by movement disorders associated with BG dysfunction. Very frequently, dystonia and tremor are reported and, to a lesser extent, myoclonus. Neuroimaging studies present inconsistent findings concerning altered brain networks and mainly focus on cortical areas. Subcortical contribution to this disorder has so far been neglected. Clinical data presenting BG dysfunction-related movement disorders in CRPS patients raise the hypothesis of BG dysfunction in this syndrome. Moreover, several neuroimaging studies documented abnormalities in the BG and in the frontal, parietal and limbic cortical areas.

These regions are functionally and anatomically connected in motor, pain and working memory networks. Put together, these findings call for further characterization of the dynamic cortical and subcortical interactions in CRPS.

SIGNIFICANCE:

This paper presents an overview of our current knowledge about BG pathology in CRPS. A better understanding of the involvement of the BG in the CRPS pathology holds the potential for developing and improving efficacious, mechanism-based treatment modalities.

61. FIBROMYALGIA

Reflexology helps

Holist Nurs Pract. 2016 Nov/Dec;30(6):351-359.

Effects of Reflexology on Pain in Patients With Fibromyalgia.

Akin Korhan E¹, Uyar M, Eyigör C, Yönt GH, Khorshid L.

The aim of this study was to investigate the effect of reflexology on pain intensity in patients with fibromyalgia, using an experimental repeated-measures design, and a convenience sample of 30 fibromyalgia inpatients.

Thirty patients aged 18 to 70 years with fibromyalgia and hospitalized in the algology clinic were taken as a convenience sample. Patients received a total of 12 60-minute sessions of reflexology

over a period of 6 consecutive weeks. Reflexology was carried out bilaterally on the hands and feet of patients at the reflex points relating to their pain at a suitable intensity and angle. Subjects had pain scores taken immediately before the intervention (0 minute), and at the 60th minute of the intervention. Data were collected over a 10-month period in 2012. The patients' mean pain intensity scores were reduced by reflexology, and this decrease improved progressively in the first and sixth weeks of the intervention, indicating a cumulative dose effect.

The results of this study implied that the inclusion of reflexology in the routine care of patients with fibromyalgia could provide nurses with an effective practice for reducing pain intensity in these patients.

62 A. NUTRITION/VITAMINS

Exercise and poor nutrition

J Affect Disord. 2016 Oct 27. pii: S0165-0327(16)31202-2. doi: 10.1016/j.jad.2016.10.035.

Sugars, exercise and health.

Codella R¹, Terruzzi I², Luzi L³.

BACKGROUND:

There is a direct link between a variety of addictions and mood states to which exercise could be relieving. Sugar addiction has been recently counted as another binge/compulsive/addictive eating behavior, differently induced, leading to a high-significant health problem. Regularly exercising at moderate intensity has been shown to efficiently and positively impact upon physiological imbalances caused by several morbid conditions, including affective disorders.

Even in a wider set of psychiatric diseases, physical exercise has been prescribed as a complementary therapeutic strategy.

METHOD:

A comprehensive literature search was carried out in the Cochrane Library and MEDLINE databases (search terms: sugar addiction, food craving, exercise therapy, training, physical fitness, physical activity, rehabilitation and aerobic).

RESULTS:

Seeking high-sugar diets, also in a reward- or craving-addiction fashion, can generate drastic metabolic derangements, often interpolated with affective disorders, for which exercise may represent a valuable, universal, non-pharmacological barrier.

LIMITATIONS:

More research in humans is needed to confirm potential exercise-mechanisms that may break the bond between sugar over-consumption and affective disorders.

CONCLUSIONS:

The purpose of this review is to address the importance of physical exercise in reversing the gloomy scenario of unhealthy diets and sedentary lifestyles in our modern society.

Vit. D and osteoporosis

Bone. 2016 Nov 4. pii: S8756-3282(16)30327-1. doi: 10.1016/j.bone.2016.11.002.

Vitamin D and calcium supplementation for three years in postmenopausal osteoporosis significantly alters bone mineral and organic matrix quality.

Paschalis EP¹, Gamsjaeger S², Hassler N², Fahrleitner-Pammer A³, Dobnig H⁴, Stepan JJ⁵, Pavo I⁶, Eriksen EF⁶, Klaushofer K².

Prospective, controlled clinical trials in postmenopausal osteoporosis typically compare effects of an active drug with placebo in addition to vitamin D and calcium supplementation in both treatment arms.

While clinical benefits are documented, the effect of this supplementation in the placebo arm and in clinical practice on bone material composition properties is unknown. The purpose of the present study was to evaluate these bone quality indices (specifically mineral/matrix,

ABSTRACTS

nanoporosity, glycosaminoglycan content, mineral maturity/crystallinity, and pyridinoline content) in patients that either received long-term vitamin D (400-1200IU) and calcium (1.0-1.5g) supplementation, or did not. We have analyzed by Raman microspectroscopy the bone forming trabecular surfaces of iliac crest in pre-treatment samples of a teriparatide study and the endpoint biopsies of the control arm obtained from the HORIZON trial. In general, the mineral/matrix ratio and the glycosaminoglycan (GAG) content was higher while nanoporosity, (a surrogate for tissue water content), the mineral maturity/crystallinity (MMC) and the pyridinoline (Pyd) content was lower in patients without long-term supplementation. Moreover, all indices were significantly dependent on tissue age.

In conclusion, vitamin D and calcium supplementation is associated with altered mineral and organic matrix properties.