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2. LBP

Neurochemical changes

Neuroimage Clin. 2016 Nov 24;13:33-38. eCollection 2017.

Neurochemical changes in patients with chronic low back pain detected by proton magnetic resonance spectroscopy: A systematic review.

Zhao X¹, Xu M¹, Jorgenson K², Kong J².

BACKGROUND:

Low back pain is a highly prevalent health problem around the world, affecting 50% to 85% of people at some point in life. The purpose of this systematic review is to summarize the previous proton magnetic resonance spectroscopy studies on brain chemical changes in patients with chronic low back pain (CLBP).

METHODS:

We identified relevant studies from a literature search of PubMed and EMBASE from 1980 to March 2016. Data extraction was performed on the subjects' characteristics, MRS methods, spectral analyses, cerebral metabolites and perceptual measurements.

RESULTS:

The review identified 9 studies that met the inclusion criteria, comprised of data on 135 CLBP subjects and 137 healthy controls. Seven of these studies reported statistically different neurochemical alterations in patients with CLBP. The results showed that compared to controls, CLBP patients showed reductions of 1) *N*-acetyl-aspartate (NAA) in the dorsolateral prefrontal cortex (DLPFC), right primary motor cortex, left somatosensory cortex (SSC), left anterior insula and anterior cingulate cortex (ACC); 2) glutamate in the ACC; 3) myo-inositol in the ACC and thalamus; 4) choline in the right SSC; and 5) glucose in the DLPFC.

CONCLUSION:

This review provides evidence for alterations in the biochemical profile of the brain in patients with CLBP, which suggests that biochemical changes may play a significant role in the development and pathophysiology of CLBP and shed light on the development of new treatments for CLBP.

Balance disorders

J Back Musculoskelet Rehabil. 2016 Nov 21;29(4):887-893.

Static and dynamic balance deficiencies in chronic low back pain.

Tsigkanos C¹, Gaskell L¹, Smirniotou A², Tsigkanos G².

BACKGROUND:

According to previously conducted studies, people with Low Back Pain (LBP) present with static balance deficiencies.

OBJECTIVE:

The aim of the present study was to compare static, as well as dynamic balance ability between Chronic Low Back Pain (CLBP) and healthy subjects.

METHODS:

The CLBP group comprised 17 subjects and the control group of 16 subjects, matched for age, BMI and gender. The protocol applied compared the balance ability when performing the Star Excursion Balance Test (SEBT) and the static 1-leg stance position. The innovation introduced in the protocol was that the participants performed not only the static 1-leg stance, but also the dynamic SEBT on a force plate which recorded the target sway (TS), i.e. the Center of Pressure (CoP) excursion.

RESULTS:

The CLBP group had significantly reduced performance in SEBT, coupled with greater static and dynamic TS values. Age and especially BMI also bear a significant effect on SEBT execution. The inclusion of SEBT and TS derived scores in a stepwise logistic regression equation lead to the correct classification of 85% of the subjects.

CONCLUSIONS:

Dynamic and static balance ability provide supplementary information for the identification of the presence of CLBP, with dynamic balance being more instrumental.

4. INJECTIONS

Facet – cortisone vs PRP

A prospective study comparing platelet-rich plasma and LA/corticosteroid in intra-articular injection for the treatment of lumbar facet joint syndrome

Pain Practice, 12/19/2016

Wu J, et al.

This study emphasizes that in the treatment of lumbar facet joint syndrome, both autologous platelet-rich plasma (PRP) and LA/corticosteroid for intra-articular injection are effective, easy, and safe enough. However, for longer duration efficacy autologous PRP is a superior treatment option.

Methods

- The physicians randomized 46 eligible patients with lumbar facet joint syndrome into group A (intra-articular injection with PRP) and group B (intra-articular injection with LA/corticosteroid).
- They evaluated the following contents: pain visual analog scale (VAS) at rest and during flexion, and the Roland-Morris Disability Questionnaire (RMQ), Oswestry Disability Index (ODI), and modified MacNab criteria for pain relief and applications of post-treatment drugs.
- In this study, all outcome assessments were performed immediately after and at 1 week, 1 month, 2 months, 3 months, and 6 months after treatment.

Results

- At baseline, no significant difference between groups was observed.
- Both group A and group B revealed statistical improvements in the pain VAS score at rest or during flexion, the RMQ, and the ODI ($P < 0.01$) compared with pretreatment.
- And there were significant differences between the 2 groups on the above-mentioned items ($P < 0.05$).
- Subjective satisfaction based on the modified MacNab criteria and objective success rate were highest (80% and 85%) after 1 month, but only 50% and 20% after 6 months for group B.
- However, they increased over time for group A.
- Also, during follow-up, there were no treatment-related complications in either group.

5. SURGERY

Micordisectomy vs. fusion

Minimally invasive transforaminal lumbar interbody fusion versus percutaneous endoscopic lumbar discectomy: Revision surgery for the recurrent herniation after microendoscopic discectomy

World Neurosurgery, 12/19/2016

Yao Y, et al.

This study indicates that the two procedures, minimally invasive transforaminal lumbar interbody fusion (MIS–TLIF) and percutaneous endoscopic lumbar discectomy (PELD), have no clear advantage in terms of long–term pain or function scores. It appeared that in comparison to MIS–TLIF, PELD could lead to a better perioperative effect and less cost, however, the higher recurrence rate associated with it could not be ignored. Thus while pursuing personalized operation methods for microendoscopic discectomy (MED) recurrence these characteristics should be considered.

Methods

- This study included 105 patients who underwent either MIS–TLIF (58 cases) or PELD (47 cases) for revision of MED recurrence.
- The authors recorded and assessed the perioperative outcomes (operation time, blood loss, hospital stay), total cost, pain and functional scores (visual analog scale [VAS], Oswestry disability index [ODI], 12–item short form health survey [SF12]) with a 12–month follow–up visit, complication and recurrence condition within 12 months postoperatively.

Results

- They observed no significant difference of clinical outcome over time between these two approaches.
- In comparison to MIS–TLIF, they observed PELD to be associated with greater satisfaction in the early stage after surgery, whereas this effect was equalized after 3 months postoperatively.
- Shorter operation time, shorter hospital stay, less blood loss and less total cost were observed with PELD in comparison to MIS–TLIF, however, PELD was also associated with higher recurrence rate than MIS–TLIF.

7. PELVIC ORGANS/WOMAN'S HEALTH

Vit D and polycystic syndrome

Arch Gynecol Obstet. 2016 Dec 9.

Effect of vitamin D on biochemical parameters in polycystic ovary syndrome women: a meta-analysis.

Xue Y¹, Xu P², Xue K¹, Duan X¹, Cao J¹, Luan T¹, Li Q³, Gu L⁴.

AIM:

To investigate the therapeutical effect of vitamin D supplementation on the metabolism and endocrine parameters of PCOS patients.

MATERIALS AND METHODS:

Clinical studies investigating the therapeutic effect of vitamin D supplementation on PCOS patients were selected by searching PubMed, Embase, The Cochrane library and Web of Science until April 2016. The included articles were selected according to the inclusion criteria. Serum HOMA-IR, QUICKI, LDL, DHEAS, free testosterone (FT), total testosterone (TT), PTH, 25-hydroxy-vitamin D, and triglyceride of PCOS patients were enrolled for evaluating the therapeutic effects of vitamin D.

RESULTS:

16 studies were included in this study. There was no significant difference between the placebo group and vitamin D group in the concentration of serum 25-hydroxy-vitamin D in patients with PCOS ($P = 0.06$). After treated with vitamin D, the serum 25-hydroxy-vitamin D in PCOS patients was increased ($P < 0.00001$), while the serum PTH ($P = 0.003$) and triglyceride ($P = 0.006$) were decreased. In addition, the serum HOMA-IR, QUICKI, LDL, DHEAS, FT, and TT in PCOS patients did not change. Subgroup analysis showed that the serum triglyceride of PCOS patients was decreased by low dose of vitamin D supplementation ($<50,000$ IU) ($P = 0.03$), but no significantly changed by high-dose vitamin D supplementation ($\geq 50,000$ IU) ($P = 0.17$).

CONCLUSION:

Vitamin D supplementation significantly attenuates serum PTH and triglyceride in PCOS patients except for serum HOMA-IR, QUICKI, LDL, DHEAS, FT, and TT. Furthermore, less than 50,000 IU vitamin D supplementation is sufficient for decreasing serum triglyceride.

Ovaries and Vit. D

Hum Reprod. 2016 Dec 6.

The effect of serum vitamin D levels on ovarian reserve markers: a prospective cross-sectional study. Drakopoulos P¹, van de Vijver A¹, Schutyser V¹, Milatovic S², Anckaert E³, Schiettecatte J³, Blockeel C^{1,4}, Camus M¹, Tournaye H¹, Polyzos NP^{5,6}.

STUDY QUESTION: Is there any association between serum 25-OH vitamin D levels and ovarian reserve markers in infertile women? **WHAT IS KNOWN ALREADY:** The mechanism underlying the relationship between vitamin D deficiency and reproduction is still unclear; however, evidence indicates a potential direct negative impact on ovarian function. This is mainly due to the fact that gonadal function may be altered by vitamin D deficiency, as observed by the expression of vitamin D receptor mRNA in human ovaries, mixed ovarian cell cultures and granulosa cell cultures. On the other hand, results from clinical studies are conflicting, with some suggesting that vitamin D status is associated with ovarian reserve, whereas other cross-sectional studies have not found any significant correlation between vitamin D and AMH levels. **STUDY DESIGN, SIZE, DURATION:** This study was a prospective cross-sectional study from the Centre for Reproductive Medicine at the University Hospital of Brussels. The duration of the study was one year. **PARTICIPANTS/MATERIALS, SETTING, METHODS:** Overall, the study included 283 consecutive infertile women younger than 42 years old and undergoing their first treatment cycle in our institution. All patients were recruited within a time interval of 12 months from the initiation of the study, before undergoing infertility treatment. Women consuming vitamin D supplements or taking medication for systematic disease or women who had undergone ovarian surgery were excluded from the study. All infertile women had serum AMH and vitamin D sampled on the same day. AFC was measured on the second or third day of the first cycle following the blood sampling for the determination of AMH and 25-OH vitamin D levels. **MAIN RESULTS AND THE ROLE OF CHANCE:** Among all patients, 30.7% (n = 87) were vitamin D deficient (<20 ng/mL) whereas 69.3% (n = 196) had normal vitamin D levels (≥20 ng/mL). The mean AMH and AFC levels did not differ significantly between the two groups: AMH 3.9 μ/L (±3.8) versus 4.3 μ/L (±4.8), (P value = 0.5) and AFC 13.9 (±13.3) versus 12.7 (±11.4), (P = 0.7), respectively. No correlation was observed between 25-OH vitamin D and AMH (spearman's r = 0.02, P value = 0.7) or AFC (spearman's r = -0.02, P value = 0.7). In multiple linear regression analysis, after adjusting for potential confounders (age, BMI, smoking status, infertility cause and season of blood sampling), the regression slope in all participants for total 25OH-D predicting log₁₀ AMH was 0.006 [standard error (SE) = 0.07, P value = 0.9]. Similarly, no significant association was observed between AFC and vitamin D levels, even after controlling for relevant co-variants (regression coefficient -0.09. SE 0.08, P value = 0.2). **LIMITATIONS, REASONS FOR CAUTION:** Although this is the first prospective study to evaluate the relationship between vitamin D and the most important ovarian reserve markers (AMH and AFC), we need to acknowledge that the data used to generate the study findings are cross-sectional in nature. In this regard, we cannot generate or exclude any causal effect hypothesis. Nevertheless, our data support that an association between vitamin D and ovarian reserve markers is highly unlikely to exist. **WIDER IMPLICATIONS OF THE FINDINGS:** Although data from basic research indicate that vitamin D deficiency may have an effect on steroidogenesis and follicular development, our study, by prospectively recruiting a large number of infertile women, clearly demonstrates that vitamin D deficiency is highly unlikely to have a detrimental effect on ovarian reserve. Ongoing prospective and translational research projects are currently being conducted in order to evaluate the potential effect of vitamin D deficiency on reproductive outcome mediated through either an effect on the oocyte quality or on endometrial receptivity and embryo implantation.

Birth age and female longevity

New study identifies possible predictor for women's longevity

The North American Menopause Society News, 12/15/2016

Telomere length associated with rate of aging and maternal age at birth of last child. The study was published online in the journal Menopause.

Several studies have already shown that late maternal age at last childbirth is positively associated with maternal longevity. The Long Life Family Study (LLFS) reported that the odds of living up to the top fifth percentile were two times higher for women who had their last child past the age of 33 years than for those who had their last child before the age of 29. The study “Telomere length is longer in women with late maternal age,” used data from LLFS to show that certain factors associated with the rate of aging and longevity, such as telomere length, are also associated with later maternal age at the birth of the last child.

Telomeres are essential parts of human cells that affect how our cells age. They are caps at the end of each strand of DNA that protect the chromosomes, like the plastic tips at the end of shoelaces. Telomeres provide protection to chromosomes during the replication process to prevent the loss of DNA strands. As people age, the length of telomeres decreases. Longer lengths are typically associated with better health.

In this study, the proportion of women in the longest telomere tertile was higher for women in the fourth quartile of maternal age at the birth of their last child than in the first quartile (35.7% vs 20.2%). Compared with women who had their last child at 29, women with a later age at birth of their last child were found to have increased odds of being in the longest tertile of telomere length.

Dairy and fertility

J Nutr. 2016 Nov 23. pii: jn241521.

Dairy Food Intake Is Associated with Reproductive Hormones and Sporadic Anovulation among Healthy Premenopausal Women.

Kim K¹, Wactawski-Wende J², Michels KA¹, Plowden TC^{1,3}, Chaljub EN¹, Sjaarda LA¹, Mumford SL⁴.

BACKGROUND:

Dairy food intake has been associated with infertility; however, little is known with regard to associations with reproductive hormones or anovulation.

OBJECTIVE:

We investigated whether intakes of dairy foods and specific nutrients were associated with reproductive hormone concentrations across the cycle and the risk of sporadic anovulation among healthy women.

METHODS:

We prospectively measured serum reproductive hormones ≤ 8 times/menstrual cycle for 2 cycles from 259 regularly menstruating women (mean age: 27.3 y). Dairy food intake was assessed via 24-h dietary recalls 4 times/cycle. Dairy food intakes were assessed by 1) total and low- and high-fat dairy products; 2) dairy nutrients, including fat, lactose, calcium, and phosphorus; and 3) dairy foods, including milk, cheese, butter, cream, yogurt, and ice cream categories. Weighted linear mixed models were used to evaluate associations between dairy nutrients or food intakes and hormone concentrations. Modified Poisson regression models with robust error variance were used to evaluate anovulation. Models were adjusted for age, body mass index, race, physical activity, Mediterranean diet score, total energy, protein, fiber, caffeine, and other hormones.

RESULTS:

Each serving increase in total and low- and high-fat dairy foods and all increases in amounts of all dairy nutrients tested were associated with an ~5% reduction in serum estradiol concentrations but were not associated with anovulation. Total and high-fat dairy food intakes were positively associated with serum luteinizing hormone concentrations. We observed associations between intakes of >0 servings of yogurt (RR: 2.1; 95% CI: 1.2, 3.7) and cream (RR: 1.8; 95% CI: 1.0, 3.2) and a higher risk of sporadic anovulation compared with no intake.

CONCLUSIONS:

Our study showed associations between increasing dairy food and nutrient intakes and decreasing estradiol concentrations as well as between cream and yogurt intakes and the risk of sporadic anovulation. These results highlight the potential role of dairy in reproductive function in healthy women.

8. VISCERA

Anemia and IBS

Anemia at the time of diagnosis of inflammatory bowel disease: Prevalence and associated factors in adolescent and adult patients

Digestive and Liver Diseases, 12/19/2016

Lucendo AJ, et al.

In this retrospective cross-sectional study, the authors conclude that at inflammatory bowel disease (IBD) diagnosis, female sex and disease activity are major determinants of anemia. In Crohn's disease (CD), anemia is associated with disease behavior and with disease extension in UC.

Methods

- The authors collected analytical data and disease characteristics obtained upon diagnosis of 1,278 IBD patients [Crohn's disease/ulcerative colitis (CD/UC): 718/560].

Results

- At diagnosis, anemia was present in 41.2% of patients (47% and 33.8% of CD and UC patients, respectively; $p < 0.001$), being severe in 5.5%.
- With no differences between CD and UC iron deficiency anemia represented 69.6% of cases.
- In both CD and UC, female sex was the strongest risk factor for anemia (OR 7.11; 95%CI 4.18-12.10 and 6.55; 95%CI 3.39-12.63, respectively), followed by elevated (≥ 2 mg/dL) C-reactive protein (OR 4.08; 95%CI 2.39-6.97 and 4.58; 95%CI 2.26-9.27, respectively).
- In CD current smoking was a risk factor for anemia (OR 2.23; 95%CI 1.24-4.02), but a protective one in UC (OR 0.36; 95%CI 0.14 - 0.92).
- A penetrating CD behavior increased the risk of anemia (OR 3.34; 95%CI 1.36-8.21).
- In UC, anemia increased with disease extension (E2 + E3) (OR 1.80; 95%CI 1.13-2.86).

Vit D & Crohn's

Dig Dis Sci. 2016 Dec 14.

Impact of High-Dose Vitamin D3 Supplementation in Patients with Crohn's Disease in Remission: A Pilot Randomized Double-Blind Controlled Study.

Narula N¹, Cooray M², Anglin R², Muqtadir Z², Narula A², Marshall JK².

AIM:

To assess the tolerability and efficacy of high-dose vitamin D3 in patients with Crohn's disease (CD).

METHODS:

This was a randomized, double-blind placebo-controlled trial of high-dose vitamin D3 at 10,000 IU daily (n = 18) compared to 1000 IU daily (n = 16) for 12 months in patients with CD in remission. The primary outcome was change in serum 25-hydroxy-vitamin D levels. Secondary outcomes included clinical relapse rates and changes in mood scores.

RESULTS:

High-dose vitamin D3 at 10,000 IU daily significantly improved 25-hydroxy-vitamin D levels from a mean of 73.5 nmol/L [standard deviation (SD) 11.7 nmol/L] to 160.8 nmol/L (SD 43.2 nmol/L) (p = 0.02). On an intention-to-treat basis, the rate of relapse was not significantly different between patients receiving low- and high-dose vitamin D3 (68.8 vs 33.3%, p = 0.0844). In per-protocol analysis, clinical relapse of Crohn's disease was less frequently observed in patients receiving a high dose (0/12 or 0%) compared to those receiving a low dose of 1000 IU daily (3/8 or 37.5%) (p = 0.049). Improvement in anxiety and depression scores and a good safety profile were observed in both groups treated with vitamin D3.

CONCLUSIONS:

Oral supplementation with high-dose vitamin D3 at 10,000 IU daily significantly improved serum 25-hydroxy-vitamin D levels. Rates of clinical relapse were similar between both groups. Larger studies using high-dose vitamin D3 for treatment of inflammatory bowel diseases are warranted.

GOV REGISTRATION NO:

NCT02615288.

Mesh problems

Researchers examine effect of mesh treatment on women with pelvic organ prolapse and incontinence

Weill Cornell Medical College News, 12/09/2016

A synthetic mesh that is commonly used to treat a form of urinary incontinence as well as the weakening of the female pelvis' walls can lead to complications that increase in frequency with the amount of mesh used, new Weill Cornell Medicine research suggests. In the United States, about one in five women by the age of 80 will undergo surgery for stress urinary incontinence (SUI), or pelvic organ prolapse (POP). While surgeons contend that mesh increases the success of these surgeries by reinforcing the weakened vaginal walls or acting as a sling to support the urethra, recent studies suggest that the device actually leads to infections and complications.

For their study, published Nov. 30 in the journal *JAMA Surgery*, researchers analyzed data from more than 41,000 women who underwent surgery for the conditions between 2008 and 2012. They found that women experienced complications — such as erosion, chronic pain and the need for repeat surgery — regardless of the amount of mesh used in the procedure, with such problems increasing in direct correlation with device volume. The investigators say their results underscore the need for patients to become better informed about the risks before deciding to undergo surgery that involves mesh.

“We found that no amount of mesh is completely safe,” said senior study author Dr. Art Sedrakyan, a professor of healthcare policy and research and of healthcare policy and research in cardiothoracic surgery at Weill Cornell Medicine.

“But there is a ‘dose–response’ relationship, meaning the more mesh used, the more erosions or complications occur,” added lead author Dr. Bilal Chughtai, an assistant professor of urology and of urology in obstetrics and gynecology at Weill Cornell Medicine and a urologist at New York–Presbyterian/Weill Cornell Medical Center.

“We wanted to get a clearer understanding of mesh’s real–world effectiveness,” Dr. Sedrakyan said. “Oftentimes, when products come on the market, only the benefits are initially recognized while real–world evidence helps us understand the balance of benefits and harms.”

Using data from the New York Statewide Planning and Research Cooperative System, which collects patient and treatment information for every hospital discharge, ambulatory surgery and emergency department admission in the state, the researchers divided the study population into four groups based on the extent of mesh use and followed participants for one year after their initial surgery.

While patients who had POP repair surgery with mesh and SUI surgery that involved a mesh sling were found to have the highest estimated risk of erosion and repeat surgery, researchers discovered that mesh created complications for every group.

“Hopefully our findings will showcase the limitations of current technology so companies, innovators and regulators can work on improving it,” Dr. Sedrakyan said. “We need to make sure every device that enters the market is safe and effective.”

10 A. CERVICAL SPINE**Pain education in neck pain**

Man Ther. 2016 Dec;26:132-140. doi: 10.1016/j.math.2016.08.004. Epub 2016 Aug 20.

Does a combination of physical training, specific exercises and pain education improve health-related quality of life in patients with chronic neck pain? A randomised control trial with a 4-month follow up.

Ris I¹, Sjøgaard K², Gram B³, Agerbo K⁴, Boyle E⁵, Juul-Kristensen B⁶.

AIM:

To investigate the effect of combining pain education, specific exercises and graded physical activity training (exercise) compared with pain education alone (control) on physical health-related quality of life (HR-QoL) in chronic neck pain patients.

METHODS:

A multicentre randomised controlled trial of 200 neck pain patients receiving pain education. The exercise group received additional exercises for neck/shoulder, balance and oculomotor function, plus graded physical activity training. Patient-reported outcome measures (Short Form-36 Physical and Mental component summary scores, EuroQol-5D, Beck Depression Inventory-II, Neck Disability Index, Pain Bothersomeness, Patient-Specific Functioning Scale, Tampa Scale of Kinesiophobia, Global Perceived Effect) and clinical tests (Astrand Physical Fitness, cervical Range of Motion, Pressure Pain Threshold at infraspinatus, tibialis anterior and cervical spine, Cranio-cervical Flexion, Cervical Extension muscle function, and oculomotion) were recorded at baseline and after 4 months.

RESULTS:

The exercise group showed statistically significant improvement in physical HR-QoL, mental HR-QoL, depression, cervical pressure pain threshold, cervical extension movement, muscle function, and oculomotion. Per protocol analyses confirmed these results with additional significant improvements in the exercise group compared with controls.

CONCLUSIONS:

This multimodal intervention may be an effective intervention for chronic neck pain patients.

12 A. WHIPLASH**Psychological interventions**

Spine J. 2016 Dec;16(12):1566-1581. doi: 10.1016/j.spinee.2015.08.011. Epub 2015 Aug 13.

Are psychological interventions effective for the management of neck pain and whiplash-associated disorders? A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration.

Shearer HM¹, Carroll LJ², Wong JJ³, Côté P⁴, Varatharajan S⁵, Southerst D⁶, Sutton DA⁶, Randhawa KA⁵, Yu H⁶, Mior SA⁷, van der Velde GM⁸, Nordin MC⁹, Stupar M¹⁰, Taylor-Vaisey AL⁶.

BACKGROUND CONTEXT: In 2008, the lack of published evidence prevented the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders (Neck Pain Task Force [NPTF]) from commenting on the effectiveness of psychological interventions for the management of neck pain.

PURPOSE: This study aimed to update findings of the NPTF and evaluate the effectiveness of psychological interventions for the management of neck pain and associated disorders (NAD) or whiplash-associated disorders (WAD).

STUDY DESIGN/SETTING: This study used systematic review and best-evidence synthesis.

SAMPLE: Randomized controlled trials, cohort studies, and case-control studies comparing psychological interventions to other non-invasive interventions or no intervention were the samples used in this study.

OUTCOME MEASURES: The outcome measures are (1) self-rated recovery; (2) functional recovery; (3) clinical outcomes; (4) administrative outcomes; and (5) adverse effects.

METHODS:

We searched six databases from 1990 to 2015. Randomized controlled trials, cohort studies, and case-control studies meeting our selection criteria were eligible for critical appraisal. Random pairs of independent reviewers used the Scottish Intercollegiate Guidelines Network criteria to critically appraise eligible studies. Studies with a low risk of bias were synthesized following best evidence synthesis principles. This study was funded by the Ontario Ministry of Finance.

RESULTS:

We screened 1,919 articles, 19 were eligible for critical appraisal and 10 were judged to have low risk of bias. We found no clear evidence supporting relaxation training or cognitive behavioral therapy (CBT) for persistent grades I-III NAD for reducing pain intensity or disability. Similarly, we did not find evidence to support the effectiveness of biofeedback or relaxation training for persistent grade II WAD, and there is conflicting evidence for the use of CBT in this population. However, adding a progressive goal attainment program to functional restoration physiotherapy may benefit patients with persistent grades I-III WAD. Furthermore, Jyoti meditation may help reduce neck pain intensity and bothersomeness in patients with persistent NAD.

CONCLUSIONS:

We did not find evidence for or against the use of psychological interventions in patients with recent onset NAD or WAD. We found evidence that a progressive goal attainment program may be helpful for the management of persistent WAD and that Jyoti meditation may benefit patients with persistent NAD. The limited evidence of effectiveness for psychological interventions may be due to several factors, such as interventions that are ineffective, poorly conceptualized, or poorly implemented. Further methodologically rigorous research is needed.

13. CRANIUM/TMJ

Sleep apnea and liver disease

Sleep Breath. 2016 Dec 13.

The association between continuous positive airway pressure therapy and liver disease development in obstructive sleep apnea/hypopnea syndrome patients: a nationwide population-based cohort study in Taiwan.

Hang LW^{1,2,3}, Chen CF⁴, Wang CB⁴, Wu TN^{4,5}, Liang WM^{6,7}, Chou TC^{8,9}.

PURPOSE:

Studies on the association between continuous positive airway pressure (CPAP) treatment and liver diseases such as non-alcoholic fatty liver disease (NAFLD) and cirrhosis in patients with obstructive sleep apnea/hypopnea syndrome (OSAHS) are limited. To the best of our knowledge, none exists that makes use of a national database in an Asian population. This study aims to evaluate the effects of CPAP treatment on patients with these two disorders in a retrospective, population-based study in Taiwan.

METHODS:

Using the Taiwan National Health Insurance claims database, this study collected the data of OSAHS patients diagnosed between 2000 and 2008 and divided them into CPAP treatment and non-CPAP treatment groups. All subjects were followed up until 2010. Liver disease incidence and risk were calculated.

RESULTS:

The CPAP group had a lower cumulative incidence rate of developing liver disease than the non-CPAP group within the observation periods ($p < 0.001$). After adjusting for age, gender, urbanization level, and comorbidities, the CPAP treatment group showed a lower risk of developing liver disease compared with the non-CPAP treatment group (sub-aHR of 0.66 (95% CI 0.55-0.80), $p < 0.001$).

CONCLUSIONS:

Our observations suggest that CPAP treatment may play an important role to delay the progression of liver disease in OSAHS patients and decreases the incidence of liver disease among OSAHS patients. Thus, CPAP therapy may be a feasible way to decrease the risk of liver disease among patients with OSAHS

Tinnitus

Man Ther. 2016 Dec;26:125-131. doi: 10.1016/j.math.2016.08.005. Epub 2016 Aug 26.

Does multi-modal cervical physical therapy improve tinnitus in patients with cervicogenic somatic tinnitus?

Michiels S¹, Van de Heyning P², Truijzen S³, Halleman A⁴, De Hertogh W⁵.

BACKGROUND:

Tinnitus can be related to many different aetiologies such as hearing loss or a noise trauma, but it can also be related to the somatosensory system of the cervical spine, called cervicogenic somatic tinnitus (CST). Case studies suggest a positive effect of cervical spine treatment on tinnitus complaints in patients with CST, but no experimental studies are available.

OBJECTIVE:

To investigate the effect of a multimodal cervical physical therapy treatment on tinnitus complaints in patients with CST.

DESIGN:

Randomized controlled trial.

PATIENTS:

Patients with a combination of severe subjective tinnitus (Tinnitus Functional Index (TFI): 25-90 points) and neck complaints (Neck Bournemouth Questionnaire (NBQ) > 14 points).

INTERVENTION:

All patients received cervical physical therapy for 6 weeks (12 sessions). Patients were randomized in an immediate-start therapy group (n = 19) and a 6-week delayed-start therapy group (n = 19).

MEASUREMENTS:

TFI and NBQ-scores were documented at baseline, after the wait-and-see period in the delayed-start group, after treatment and after 6 weeks follow-up. The Global Perceived Effect (GPE) was documented at all measuring moments, except at baseline.

RESULTS:

In all patients (n = 38) TFI and NBQ-scores decreased significantly after treatment (p = 0.04 and p < 0.001). NBQ-scores remained significantly lower after follow-up (p = 0.001). Immediately after treatment, 53% (n = 38) experienced substantial improvement of tinnitus. This effect was maintained in 24% of patients after follow-up at six weeks.

CONCLUSION:

Cervical physical therapy can have a positive effect on subjective tinnitus complaints in patients with a combination of tinnitus and neck complaints. Larger studies, using more responsive outcome measures, are however necessary to prove this effect.

Bruxism and sleep apnea

J Oral Rehabil. 2016 Dec 14. doi: 10.1111/joor.12468.

Relationship between obstructive sleep apnea syndrome and sleep bruxism: a systematic review.

Jokubauskas L¹, Baltrušaitytė A².

BACKGROUND:

Obstructive sleep apnea syndrome (OSAS) is a clinical risk factor for sleep bruxism (SB). Both, OSAS and SB, are reported to be associated with sleep-related arousal reactions, although no clear causative link has been established.

OBJECTIVE(S):

To systematically review the most recent studies on the relationship between OSAS and SB.

METHODS:

An electronic literature search was conducted of the MEDLINE, ScienceDirect, Wiley Online Library, SAGE Journals and EBSCOhost databases covering the period January 2006 and September 2016. Sequential screenings at the title, abstract, and full-text levels were performed. The review included observational studies in the English language with a clearly established aim to assess the relationship between OSAS and SB using full-night PSG. The seven-item quality-assessment tool for experimental bruxism studies was used to assess the methodology across the studies.

RESULTS:

After a comprehensive screening of titles, abstracts and full texts, only three studies that met the predefined criteria were finally included in this systematic review. Two studies gave evidence that OSAS is associated with the occurrence of SB events: (i) SB events frequently occur during micro-arousal events consequent on apnea-hypopnea (AH) events; (ii) most SB events occur in temporal conjunction with AH events termination. However, one study did not report a strong association between AH and SB events.

CONCLUSIONS:

There is not enough scientific data to define a clear causative link between OSAS and SB. Although, they appear to share common clinical features. Further studies should focus on the intermediate mechanisms between respiratory and SB events. This article is protected by copyright. All rights reserved.

TMJ and posture

J Oral Rehabil. 2016 Dec 14. doi: 10.1111/joor.12470.

Subjects with temporomandibular joint disk displacement do not feature any peculiar changes in body posture.

Rocha T¹, Castro MA¹, Guarda-Nardini L², Manfredini D³.

BACKGROUND:

The presence of body posture changes among patients with temporomandibular disorders (TMD) has been a controversial topic in dentistry. Based on that, the aim of this study was to assess postural features of pain-free subjects with internal derangement of the temporomandibular joint (TMJ), viz., disk displacement, when compared to subjects with normal disk position.

MATERIALS AND METHODS:

21 subjects with unilateral, pain-free TMJ disk displacement (DD) and 21 subjects without any TMD signs of symptoms were assessed for body posture changes by means of posturographic evaluation of several body segments and postural balance reactions through the center of mass during jaw movements using a balance platform.

RESULTS:

Posturographic measurements showed the absence of any significant differences between the two groups in any of the outcome parameters. Similarly, all balance platform responses to mandibular movements were not different between groups.

CONCLUSIONS:

There are no significant differences in body posture between subjects with and without unilateral disk displacement in the temporomandibular joint. Such observations, indicating a well-preserved postural balance in the presence of TMJ internal derangement, put into serious question the potential influence of TMJ disorders on whole body posture and viceversa. This article is protected by copyright. All rights reserved.

Arthrocentesis

J Oral Rehabil. 2016 Dec 14. doi: 10.1111/joor.12467.

The Impact of Arthrocentesis with and without Hyaluronic Acid Injection in the Prognosis and Synovial Fluid Myeloperoxidase Levels of Patients with Painful Symptomatic Internal Derangement of Temporomandibular Joint: A Randomized Controlled Clinical Trial.

Ozdamar SM¹, Alev B², Yarat A².

BACKGROUND:

We aimed to assess the relationship between myeloperoxidase (MPO) and internal derangement (ID) of temporomandibular joint (TMJ) and effects of arthrocentesis procedure, either alone or in combination with hyaluronic acid (HA) injection on the prognosis of ID of TMJ.

METHODS:

A prospective randomized controlled trial has been conducted through patients, who underwent arthrocentesis for the treatment of ID of TMJ, were randomly divided into two groups. Group SS (n=10) and Group HA (n=14) patients were implemented 0.9% NaCl solution and sodium-hyaluronate intra-articularly, respectively. Synovial fluid samples were assayed for MPO at the time of arthrocentesis and pain visual analogue scale (VAS) and maximum mouth opening (MMO) scores were recorded at pre- and postoperative periods as well as 1st week, 1st month and 3rd month intervals.

RESULTS:

There was a statistically significant decrease in MPO levels between the 1st to 2nd arthrocenteses only in Group 2 (p=0,001). Both VAS scores and MMO measurements decreased in the course of time following arthrocentesis and do not differ between the patients administered HA or SS. Similarly MPO levels do not change significantly between the two groups at either 1st or 2nd arthrocenteses. In HA group, MPO levels significantly decreased from 1st to 2nd sessions. In HA group MPO levels decreased significantly only in patients with clinical success.

CONCLUSIONS:

Arthrocentesis procedure improves both pain VAS and MMO scores in the course of time, but these parameters do not differ between patients receiving either HA or SS. HA significantly reduces levels of MPO in synovial fluid, but SS do not. HA appears to alleviate inflammation inside the TMJ in patients with TMJ-ID. This article is protected by copyright. All rights reserved.

Maxillomandibular advancement**Maxillomandibular advancement for obstructive sleep apnea syndrome treatment: Long-term results**

Aurélie Vigneron, MD Renaud Tamisier, MD PhD Emmanuelle Orset, MD Jean-Louis Pepin, MD PhD
Georges Bettega, MD PhD

DOI: <http://dx.doi.org/10.1016/j.jcms.2016.12.001>

Summary

Study Objectives. We evaluated the long term effectiveness of maxillomandibular advancement (MMA) for OSAS treatment Patients. This retrospective study reviewed the patients treated by MMA for OSAS between 1995 and 2009. They were evaluated by complete polysomnography, cephalometry and quality of life questionnaire. The minimum follow up was 3 years. Success rate was defined by an IAH<10 with at least a 50% reduction.

Measurements and results. 88 patients had MMA during this period. 34 accepted the evaluation (28 men, 6 women). Mean age was 52.4±14. Mean follow-up was 12.5 years. Long term success rate was 28% for the entire group, postoperative IAH was reduced between 50 to 80% for all the patients except one. Success rate was 100% for young patients (age< 45), with BMI<25 and IAH<45 and SNB<75° and narrow retrobasinlingual space (<8 mm) and with preoperative orthodontics. Esthetic and sleep results were better with a moderate maxillary advancement and anterior impaction. There was no skeletal relapse. The major postoperative complication was inferior alveolar nerve hypoesthesia.

Conclusions. MMA is an effective and stable treatment of OSAS in selected patients. Preoperative orthodontics is recommended.

14. HEADACHES**Anxiety and migraine's**

Headache. 2016 Dec 19. doi: 10.1111/head.13010.

Untangling the Association Between Migraine, Pain, and Anxiety: Examining Migraine and Generalized Anxiety Disorders in a Canadian Population Based Study.

Fuller-Thomson E¹, Jayanthikumar J¹, Agbeyaka SK¹.

OBJECTIVE:

The aims of this study were to investigate: (1) the prevalence and unadjusted and adjusted odds of 12-month generalized anxiety disorder (GAD) among adults with migraine in comparison to those without migraine; (2) If debilitating pain and/or limitations in instrumental activities of daily living (IADLs) are mediators of the migraine-GAD association; and (3) Factors associated with past year GAD among adults with migraine.

METHODS:

Secondary data analysis of the nationally representative 2012 Canadian Community Health Survey-Mental Health (CCHS-MS), a population-based survey of community dwellers with a response rate of 68.9%. The first subsample included those with (n = 2232) and without migraine (n = 19,270), and the second subsample was restricted to those with migraine (n = 2232). GAD was based on the WHO-CIDI scale.

RESULTS:

Fully, 6% of those with migraines had past year GAD in comparison of 2.1% of those without migraine ($P < .001$). The socio-demographically adjusted odds of past year GAD were two and a half times higher among those with migraine than those without (OR= 2.46; 95% CI= 2.00, 3.02). A path analysis indicated that debilitating pain and limitations in IADLs were mediators in the relationship between migraine and GAD. In the sample restricted to migraineurs, the factors associated with higher odds of 12-month GAD included having a university degree, having low income, being without a confidant, and being male.

CONCLUSIONS:

Generalized anxiety disorder is robustly associated with migraine and targeted outreach and interventions are warranted.

Childhood abuse and migraines

Headache. 2016 Dec 5. doi: 10.1111/head.12994.

Emotional Abuse History and Migraine Among Young Adults: A Retrospective Cross-Sectional Analysis of the Add Health Dataset.

Tietjen GE¹, Karmakar M², Amialchuk AA³.

OBJECTIVES:

To define and examine the relationship between self-reported childhood abuse and migraine among young adults.

BACKGROUND:

Headache and migraine have been linked to childhood abuse in numerous studies, but there is incomplete characterization of headache types, and limited assessment of abuse types and frequency. Only one population-based study has examined the relationship between emotional abuse and migraine. None have investigated the temporal relationship between onset of abuse and of migraine.

METHODS:

We analyzed data from 14,356 adults aged 24-32 years in Wave 4, which is a cross-sectional subset of the longitudinal Add Health study. Participants were queried regarding abuse (emotional, physical and sexual) during childhood, diagnosis of migraine, depression and anxiety by healthcare providers, and symptoms of current depression. We used logistic regression to estimate the association between childhood abuse and migraine, controlling for socio-demographic factors, current depression, and lifetime diagnosis of anxiety and depression.

RESULTS:

About 14% (n = 2040) of respondents reported migraine. Participants with migraine (vs no migraine) reported significantly higher rates of childhood abuse overall (60.6% vs 48.9%), including emotional (57.8% vs 45.4%), sexual (8.4% vs 4.6%) and physical (22.4% vs 17.9%) abuse. Emotional abuse had a stronger association with migraine (odds ratio [OR] 1.62; 95% confidence interval [CI] 1.43-1.85) when compared with physical (OR 1.06; 95% CI 0.89-1.68) and sexual abuse (OR 1.06; 95% CI 0.93-1.68), adjusting for socio-demographic factors. The emotional abuse-migraine association remained even when controlling for lifetime diagnosis of depression and anxiety (OR 1.37; 95% CI 1.19-1.57) and for current depression (OR 1.47; 95% CI 1.30-1.67). The odds of migraine increased with increasing number of abuse types reported. There was a U-shaped distribution of odds of migraine associated with frequency of occurrences of emotional abuse, peaking at one time (OR 1.65; 95% CI 1.34-2.03) and \geq six times (OR 1.77; 95% CI 1.49-2.10).

CONCLUSIONS:

Emotional abuse during childhood contributed more than physical or sexual abuse to the development of migraine. There is a dose-response relationship with increasing number of abuse types associated with rising odds of migraine. In addition, the relationship between the frequency of emotional abuse and the odds of migraine follows a U-shape pattern.

22 A. IMPINGMENT**Overhead athlete's**

J Sport Rehabil. 2016 Nov 11:1-22.

Cross Sectional Area of the Supraspinatus Muscle and Acromio-humeral Distance in Overhead Athletes with and Without Shoulder Pain: A Cross-sectional Study.

Benitez-Martinez JC¹, Casaña-Granell J¹, de Llago YE², Villaron-Casales C³, Espi-Lopez GV¹, Jimenez-Diaz F⁴.

CONTEXT:

The supraspinatus muscle has an important role in the stabilization of the glenohumeral joint. Identifying abnormalities concerning its size and the subacromial space in the presence of pain may be relevant to provide more specific treatments focused on the etiology of pain.

OBJECTIVE:

to determinate whether painful shoulder causes changes in the supraspinatus cross-sectional area (CSA) and the acromio-humeral distance (AHD) between overhead athletes.

DESIGN:

Cross-sectional study.

SETTING:

University campus and local sports clubs' Physical Therapist room.

PARTICIPANTS:

Eighty-one male overhead athletes were divided into two groups, according to the presence of shoulder pain and clinical symptoms.

MAIN OUTCOME MEASURES:

Ultrasonography measurements of the supraspinatus CSA and the AHD in two groups of overhead athletes with and without pain.

RESULTS:

In the pain group, the CSA was significantly smaller compared with the no pain group. No differences between groups were found in the AHD measurement.

CONCLUSIONS:

Shoulder pain in overhead athletes was associated with a reduction in their supraspinatus muscle CSA, but not in the AHD. These findings suggest that muscle atrophy exists in the presence of pain. However, in active overhead athletes, the AHD is not clearly reduced in overhead athletes with shoulder pain. Further studies are needed to understand this condition.

22 B. INSTABILITY**Comparison of surgical approaches**

Am J Sports Med. 2016 Dec;44(12):3198-3205. Epub 2016 Aug 8.

Arthroscopic Bankart Repair Versus Open Bristow-Latarjet for Shoulder Instability: A Matched-Pair Multicenter Study Focused on Return to Sport.

Blonna D¹, Bellato E², Caranzano F³, Assom M³, Rossi R³, Castoldi F².

Author information

Abstract

BACKGROUND:

The arthroscopic Bankart repair and open Bristow-Latarjet procedure are the 2 most commonly used techniques to treat recurrent shoulder instability.

PURPOSE: To compare in a case control-matched manner the 2 techniques, with particular emphasis on return to sport after surgery.

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

METHODS:

A study was conducted in 2 hospitals matching 60 patients with posttraumatic recurrent anterior shoulder instability with a minimum follow-up of 2 years (30 patients treated with arthroscopic Bankart procedure and 30 treated with open Bristow-Latarjet procedure). Patients with severe glenoid bone loss and revision surgeries were excluded. In one hospital, patients were treated with arthroscopic Bankart repair using anchors; in the other, patients underwent the Bristow-Latarjet procedure. Patients were matched according to age at surgery, type and level of sport practiced before shoulder instability (Degree of Shoulder Involvement in Sports [DOSIS] scale), and number of dislocations. The primary outcomes were return to sport (Subjective Patient Outcome for Return to Sports [SPORTS] score), rate of recurrent instability, Oxford Shoulder Instability Score (OSIS), Subjective Shoulder Value (SSV), Western Ontario Shoulder Instability Index (WOSI), and range of motion (ROM).

RESULTS:

After a mean follow-up of 5.3 years (range, 2-9 years), patients who underwent arthroscopic Bankart repair obtained better results in terms of return to sport (SPORTS score: 8 vs 6; $P = .02$) and ROM in the throwing position (86° vs 79° ; $P = .01$), and they reported better subjective perception of the shoulder (SSV: 86% vs 75%; $P = .02$). No differences were detectable using the OSIS or WOSI. The rate of recurrent instability was not statistically different between the 2 groups (Bankart repair 10% vs Bristow-Latarjet 0%; $P = .25$), although the study may have been underpowered to detect a clinically important difference in this parameter. The multiple regression analysis showed that the independent variables associated with return to sport were preoperative DOSIS scale, type of surgery, and recurrent dislocations after surgery. Patients who played sports with high upper extremity involvement (eg, swimming, rugby, martial arts) at a competitive level (DOSIS scale 9 or 10) had a lower level of return to sport with both repair techniques.

CONCLUSION:

Arthroscopic stabilization using anchors provided better return to sport and subjective perception of the shoulder compared with the open Bristow-Latarjet procedure in the population studied. Recurrence may be higher in the arthroscopic Bankart group; further study is needed on this point.

27. HIP**Pain and impairments**

Gait Posture. 2016 Dec 5;52:237-243. doi: 10.1016/j.gaitpost.2016.12.005.

Pain, not structural impairments may explain activity limitations in people with gluteal tendinopathy or hip osteoarthritis: A cross sectional study.

Fearon A¹, Neeman T², Smith P³, Scarvell J⁴, Cook J⁵.

QUESTION:

What are the functional differences between people with greater trochanteric pain syndrome (GT), hip osteoarthritis (OA) or an asymptomatic population as measured by walking, Time Up and Go, single leg standing and strength?

DESIGN:

Cross sectional study with blinded measurers.

PARTICIPANTS:

38 participants with GT, 20 with end stage hip OA and 21 asymptomatic healthy control (AS) participants. All participants were women.

OUTCOME MEASURES:

Pain (numeric rating scale), Walking speed (m/s), cadence (steps/min) and step length (m) measured via the 10m walk test and the Timed Up and Go; balance via single leg stance (s) duration; and hip abduction, adduction, medial and lateral rotation strength, standardized to body mass (BM) via the body mass average index (BMavg), measured via a wall mounted dynamometer.

RESULTS:

The two symptomatic groups reported similar pain levels ($p=0.226$), more pain than the AS group ($p<0.000$). Compared to the AS participants, participants with GT or hip OA demonstrated lower walking speed (10mwt and TUG, $p<0.001$), lower cadence and shorter duration single leg stance on the affected leg ($p<0.05$). Participants with GT or hip OA also demonstrated bilaterally weaker hip abduction than the AS group ($p\leq 0.005$). Compared to AS and GT participants, participants with hip OA demonstrated adduction weakness on the affected side ($p=0.008$ and $p=0.002$ respectively).

CONCLUSION:

There is a significant level of dysfunction and impairments associated with GT and hip OA. As activity limitations do not appear to be differentiated by structural impairments, we suggest that pain, rather than the underlying pathology may be the driving impairment that leads to walking and single leg standing dysfunction.

34. PATELLA**Plica****MUSCULOSKELETAL**

Year : 2016 | **Volume :** 26 | **Issue :** 4 | **Page :** 455-459

The correlation between medial plica and trochlear dysplasia: An MRI study

Trochlear dysplasia is the most commonly encountered congenital etiologic factor of anterior knee pain.

Aims: The purpose of this study was to evaluate the relationship between trochlear dysplasia with medial patellar plica as well as to investigate the distribution of plica types according to types of dysplasia.

Settings and Design: This is a retrospective case-control study.

Materials and Methods: This study was conducted among 138 knee magnetic resonance imaging (MRI) scans. The presence of medial plica and its types were compared among 69 patients in whom trochlear dysplasia had been detected and 69 individuals with normal trochlear who were of the same age and gender as the patient group.

Statistical Analysis: Trochlear dysplasia and medial plica was compared by Chi-square with Yates correction and Fisher's exact probability tests ($P < 0.001$). The data were presented as mean, standard deviation, minimum–maximum, frequency, and percentage.

Results: Of all the patients ($n = 138$), the number of patients in whom plica was observed was $n = 104$ (75.3%), and the distribution of plica type was as follows: $n = 70$ (67.3%) Type 1, $n = 25$ (24%) Type 2, and $n = 9$ (8.6%) Type 3. Medial plica was more frequently observed in patients with trochlear dysplasia ($P < 0.001$). Type 2 and Type 3 medial plica were more frequently encountered in trochlear dysplasia ($P < 0.001$). Type 3 plica was not seen in patients with normal trochlea.

Conclusion: Medial patellar plica is more frequently seen in trochlear dysplasia. As the type of trochlear dysplasia progresses, the prevalence of thicker and shelf-shaped plica increases.

Biomechanical management

Int J Sports Phys Ther. 2016 Dec;11(6):877-890.

CURRENT CONCEPTS IN BIOMECHANICAL INTERVENTIONS FOR PATELLOFEMORAL PAIN.

Willy RW¹, Meira EP².

Patellofemoral pain (PFP) has historically been a complex and enigmatic issue.

Many of the factors thought to relate to PFP remain after patients' symptoms have resolved making their clinical importance difficult to determine. The tissue homeostasis model proposed by Dye in 2005 can assist with understanding and implementing biomechanical interventions for PFP. Under this model, the goal of interventions for PFP should be to re-establish patellofemoral joint (PFJ) homeostasis through a temporary alteration of load to the offended tissue, followed by incrementally restoring the envelope of function to the baseline level or higher. High levels of PFJ loads, particularly in the presence of an altered PFJ environment, are thought to be a factor in the development of PFP. Clinical interventions often aim to alter the biomechanical patterns that are thought to result in elevated PFJ loads while concurrently increasing the load tolerance capabilities of the tissue through therapeutic exercise. Biomechanics may play a role in PFJ load modification not only when addressing proximal and distal components, but also when considering the involvement of more local factors such as the quadriceps musculature.

Biomechanical considerations should consider the entire kinetic chain including the hip and the foot/ankle complex, however the beneficial effects of these interventions may not be the result of long-term biomechanical changes. Biomechanical alterations may be achieved through movement retraining, but the interventions likely need to be task-specific to alter movement patterns. The purpose of this commentary is to describe biomechanical interventions for the athlete with PFP to encourage a safe and complete return to sport.

LEVEL OF EVIDENCE: 5.

37. OSTEOARTHRITIS/KNEE**Fear of falling**

Musculoskeletal Care. 2016 Dec 7. doi: 10.1002/msc.1167.

Are fear of movement, self-efficacy beliefs and fear of falling associated with levels of disability in people with osteoarthritis of the knee? A cross sectional study.

Thompson DP¹, Moula K¹, Woby SR².

INTRODUCTION:

Osteoarthritis of the knee (OAK) can result in significant disability and previous authors have suggested that cognitive and falls-related factors may be significant determinants of function. However, no previous studies have considered the relative influence of these factors when the effects of symptoms related to OAK are also considered. Additionally, it is plausible that falls-related factors exert a greater influence in patients who have previously fallen.

METHODS:

Fifty-eight patients were recruited from an outpatient physiotherapy department. They completed measures of physical function, pain, stiffness, physical symptoms, fear avoidance, perceived consequences of falling, fear of falling and self-efficacy beliefs. Variables exhibiting significant correlations with disability were entered into a regression model. β Values were also calculated for the final model to allow the relative contribution of each variable to be established when all variables were considered. Sub-analysis was then performed using only data from patients who had previously fallen, to establish whether cognitive and falls-related factors exerted a stronger influence in this group.

RESULTS:

Pain, stiffness and joint symptoms significantly explained 75% of the variance in disability. The cognitive and falls-related variables did not significantly explain any additional variance. Only pain and stiffness exhibited significant β values in the final model. Similar findings were observed in the sub-analysis with the participants who had previously fallen, with only pain and stiffness explaining significant variance (77%) or exhibiting significant β values.

DISCUSSION:

The current findings suggested that cognitive and falls-related factors are not significantly related to disability in patients with OAK. By contrast, pain and stiffness were strongly associated with disability. This suggests that targeting cognitive and falls-related factors is unlikely significantly to improve outcome in these patients.

Depression symptoms

Age Ageing. 2016 Dec 7.

Association between lower limb osteoarthritis and incidence of depressive symptoms: data from the osteoarthritis initiative.

Veronese N^{1,2}, Stubbs B^{3,4,5}, Solmi M^{2,6,7}, Smith TO⁸, Noale M⁹, Cooper C^{10,11,12}, Maggi S⁹.

BACKGROUND:

osteoarthritis (OA) is associated with a number of medical morbidities. Although the prevalence of depression and depressive symptoms is presumed to be high in people with OA, no prospective comparative study has analyzed its incidence.

OBJECTIVE:

to determine whether OA was associated with an increased odds of developing depressive symptoms.

DESIGN:

longitudinal cohort study (follow-up: 4.2 years).

SETTING:

data were gathered from the North American Osteoarthritis Initiative (OAI) dataset.

SUBJECTS:

people at higher risk developing OA.

METHODS:

OA diagnosis was defined as the presence of OA at hand, knee, hip, back/neck or other sites at baseline. Depressive symptoms were defined using the 20-item Center for Epidemiologic Studies-Depression (cut-off 16 points) after 4 years.

RESULTS:

a total of 3,491 people without depressive symptoms at baseline were analyzed (1,506 with OA/1,985 without). Using an adjusted logistic regression analysis for 12 potential confounders, people with OA had a similar odds of depressive symptoms at follow-up compared to those without OA (odds ratio (OR): 1.26; 95% confidence of interval (CI): 0.95-1.67). However, multi-site OA (i.e. OA \geq 2 sites; OR: 1.48, 95% CI: 1.07-2.05) and the specific presence of hip (OR: 1.72; 95% CI: 1.08-2.73) or knee OA (OR: 1.43; 95% CI: 1.03-1.98) were associated with a greater odds of developing depressive symptoms compared to people without OA.

CONCLUSIONS:

this is the first study of longitudinal data to demonstrate people with multi-site, hip or knee OA have a greater odds of developing depressive symptoms compared to people without OA. This suggests that OA may be associated with future mental health burden.

Gait changes

Gait Posture. 2017 Jan;51:247-253. doi: 10.1016/j.gaitpost.2016.11.014. Epub 2016 Nov 8.

Lateral trunk lean and medializing the knee as gait strategies for knee osteoarthritis.

Gerbrands TA¹, Pisters MF², Theeven PJ³, Verschueren S⁴, Vanwanseele B⁵.

OBJECTIVE:

To determine (1) if Medial Thrust or Trunk Lean reduces the knee adduction moment (EKAM) the most during gait in patients with medial knee osteoarthritis, (2) if the best overall strategy is the most effective for each patient and (3) if these strategies affect ankle and hip kinetics.

DESIGN:

Thirty patients with symptomatic medial knee osteoarthritis underwent 3-dimensional gait analysis. Participants received verbal instructions on two gait strategies (Trunk Lean and Medial Thrust) in randomized order after comfortable walking was recorded. The peaks and impulse of the EKAM and strategy-specific kinematic and kinetic variables were calculated for all conditions.

RESULTS:

Early stance EKAM peak was significantly reduced during Medial Thrust (-29%). During Trunk Lean, early and late stance EKAM peak and EKAM impulse reduced significantly (38%, 21% and -25%, respectively). In 79% of the subjects, the Trunk Lean condition was significantly more effective in reducing EKAM peak than Medial Thrust. Peak ankle dorsi and plantar flexion, knee flexion and hip extension and adduction moments were not significantly increased.

CONCLUSIONS:

Medial Thrust and Trunk Lean reduced the EKAM during gait in patients with knee osteoarthritis. Individual selection of the most effective gait modification strategy seems vital to optimally reduce dynamic knee loading during gait. No detrimental effects on external ankle and hip moments or knee flexion moments were found for these conditions.

38 A. FOOT AND ANKLE**Post ankle impingement**

Acta Orthop Traumatol Turc. 2016 Dec 3. pii: S1017-995X(16)30284-X. doi: 10.1016/j.aott.2016.03.008.

Posterior ankle impingement syndrome in football players: Case series of 26 elite athletes.

Kudaş S¹, Dönmez G², Işık Ç³, Çelebi M⁴, Çay N⁵, Bozkurt M³.

OBJECTIVE:

To describe a clinical treatment algorithm for posterior ankle impingement (PAI) syndrome in professional football players.

MATERIAL AND METHODS:

A case series of 26 elite professional football players diagnosed and treated for posterior ankle impingement syndrome were included for the study. All of the athletes received conservative treatment with physical therapy modalities initially. If the first line medical treatment and rehabilitation was ineffective to alleviate the symptoms, ultrasound-guided corticosteroid injection was proposed and thereafter the patients underwent posterior ankle arthroscopy if the complaints are still unresolved. The pain scores (AOFAS, VAS), and time to return to play were the main outcome measures.

RESULTS:

The complaints of 18 (69.2%) players were subsided with non-surgical treatment whereas three of acute cases and five of the chronic cases did not respond to medical treatment and arthroscopic surgery was performed for eight athletes. Eighteen players returned to training for a mean time of 36.3 days (24-42 days) after conservative treatment. The patients who underwent arthroscopic surgery returned to training for a mean time of 49.8 days (42-56 days) after the surgery. All athletes returned to their previous level of competition after treatment without any complications or recurrence in a mean follow-up 36.5 months (19-77 months).

CONCLUSION:

Non-surgical treatment modalities were effective in 2/3 of posterior ankle impingement syndrome in elite football players. On the other hand, posterior ankle arthroscopy is safe and effective treatment option for posterior ankle impingement syndrome if the conservative treatment fails.

LEVEL OF EVIDENCE:

Level IV, Therapeutic study.

39 A. ORTHOTICS**Orthotics help**

Br J Sports Med. 2016 Dec 5. pii: bjsports-2016-096671. doi: 10.1136/bjsports-2016-096671.

Effectiveness of foot orthoses and shock-absorbing insoles for the prevention of injury: a systematic review and meta-analysis.

Bonanno DR^{1,2}, Landorf KB^{1,2,3}, Munteanu SE^{1,2}, Murley GS¹, Menz HB^{1,2}.

OBJECTIVE:

To investigate the evidence relating to the effectiveness of foot orthoses and shock-absorbing insoles for the prevention of musculoskeletal injury.

DESIGN:

Systematic review and meta-analysis.

ELIGIBILITY CRITERIA FOR SELECTING STUDIES:

Clinical trials evaluating the effectiveness of foot orthoses and shock-absorbing insoles for the prevention of injury.

DATA SOURCES:

Cochrane Library, CINAHL, EMBASE, MEDLINE and SPORTDiscus from their inception up to the first week of June 2016.

RESULTS:

11 trials that had evaluated foot orthoses and 7 trials that had evaluated shock-absorbing insoles were included. The median Physiotherapy Evidence Database (PEDro) score for trials that had evaluated foot orthoses and shock-absorbing insoles was 5 (range 3-8/10) and 3 (range 1-7/10), respectively. Meta-analysis found that foot orthoses were effective for preventing overall injuries (risk ratio (RR) 0.72, 95% CI 0.55 to 0.94) and stress fractures (RR 0.59, 95% CI 0.45 to 0.76), but not soft-tissue injuries (RR 0.79, 95% CI 0.55 to 1.14). In contrast, shock-absorbing insoles were not effective for preventing overall injuries (RR 0.92, 95% CI 0.73 to 1.16), stress fractures (RR 1.15, 95% CI 0.57 to 2.32) or soft-tissue injuries (RR 0.92, 95% CI 0.74 to 1.15).

CONCLUSIONS:

Foot orthoses were found to be effective for preventing overall injuries and stress fractures but not soft-tissue injuries, while shock-absorbing insoles were not found to be effective for preventing any injury. However, further well-designed trials will assist the accuracy and precision of the estimates of risk reduction as the quality of the included trials varied greatly.

45 A. MANUAL THERAPY LUMBAR & GENERAL**Helps spasticity in CP**

J Chiropr Med. 2016 Dec;15(4):299-304. Epub 2016 Sep 28.

Changes in Muscle Spasticity in Patients With Cerebral Palsy After Spinal Manipulation: Case Series.

Kachmar O¹, Voloshyn T², Hordiyevych M².

OBJECTIVE:

The purpose of this case series was to report quantitative changes in wrist muscle spasticity in children with cerebral palsy after 1 spinal manipulation (SM) and a 2-week course of treatment.

METHODS:

Twenty-nine patients, aged 7 to 18 years, with spastic forms of cerebral palsy and without fixed contracture of the wrist, were evaluated before initiation of treatment, after 1 SM, and at the end of a 2-week course of treatment. Along with daily SM, the program included physical therapy, massage, reflexotherapy, extremity joint mobilization, mechanotherapy, and rehabilitation computer games for 3 to 4 hours' duration. Spasticity of the wrist flexor was measured quantitatively using a Neuroflexor device, which calculates the neural component (NC) of muscle tone, representing true spasticity, and excluding nonneural components, caused by altered muscle properties: elasticity and viscosity.

RESULTS:

Substantial decrease in spasticity was noted in all patient groups after SM. The average NC values decreased by 1.65 newtons (from 7.6 ± 6.2 to 5.9 ± 6.5) after 1 SM. Another slight decrease of 0.5 newtons was noted after a 2-week course of treatment. In the group of patients with minimal spasticity, the decrease in NC after the first SM was almost twofold—from 3.93 ± 2.9 to 2.01 ± 1.0 . In cases of moderate spasticity, NC reduction was noted only after the 2-week course of intensive treatment.

CONCLUSIONS:

In this sample of patients with cerebral palsy, a decrease in wrist muscle spasticity was noted after SM. Spasticity reduction was potentiated during the 2-week course of treatment.

Loading with manipulation

Sci Rep. 2016 Dec 1;6:38107. doi: 10.1038/srep38107.

Tissue loading created during spinal manipulation in comparison to loading created by passive spinal movements.

Funabashi M¹, Kawchuk GN¹, Vette AH^{2,3}, Goldsmith P⁴, Prasad N⁵.

Spinal manipulative therapy (SMT) creates health benefits for some while for others, no benefit or even adverse events. Understanding these differential responses is important to optimize patient care and safety.

Toward this, characterizing how loads created by SMT relate to those created by typical motions is fundamental. Using robotic testing, it is now possible to make these comparisons to determine if SMT generates unique loading scenarios. In 12 porcine cadavers, SMT and passive motions were applied to the L3/L4 segment and the resulting kinematics tracked. The L3/L4 segment was removed, mounted in a parallel robot and kinematics of SMT and passive movements replayed robotically. The resulting forces experienced by L3/L4 were collected. Overall, SMT created both significantly greater and smaller loads compared to passive motions, with SMT generating greater anteroposterior peak force (the direction of force application) compared to all passive motions. In some comparisons, SMT did not create significantly different loads in the intact specimen, but did so in specific spinal tissues.

Despite methodological differences between studies, SMT forces and loading rates fell below published injury values. Future studies are warranted to understand if loading scenarios unique to SMT confer its differential therapeutic effects.

McKenzie and LBP

Man Ther. 2016 Dec;26:201-207. doi: 10.1016/j.math.2016.10.002. Epub 2016 Oct 5.

Classification characteristics of a chronic low back pain population using a combined McKenzie and patho-anatomical assessment.

Flavell CA¹, Gordon S², Marshman L³.

BACKGROUND:

Physiotherapists use musculo-skeletal classification systems for patient assessment. Since its early development, the McKenzie lumbar spine assessment (MK) has been incorporated into examination algorithms and combined with a series of patho-anatomical diagnostic tests. No previous studies have used a MK and a combined examination (MK-C) to provide a detailed profile of patients, report and compare the classification characteristics of a chronic low back pain (CLBP) population.

OBJECTIVE:

To report the classification characteristics of a CLBP population using MK and MK-C examinations, and conduct inter-classification comparison of the MK-C for demographics, the Oswestry Disability Index (ODI), Roland Morris Disability Index (RM), Modified Somatic Perceptions Questionnaire (MSPQ), symptom duration and intensity.

METHOD:

A prospective cross-sectional study conducted in a spinal clinic by a MK trained physiotherapist.

RESULTS:

Results were obtained in 150 patients. Using MK, 31% (n = 47) of participants were classified as inconclusive. Following MK-C only 6% of participants remained inconclusive (n = 9). The most frequent MK-C classification was facet joint syndrome (FJS) (49%). Participants with FJS were significantly older than those classified as discogenic (p < 0.001; CI 3.96–19.74), or mixed (p < 0.001; CI 5.98–36.41). Participants classified as discogenic had significantly higher RM (p = 0.022) and MSPQ (p = 0.005) scores than FJS.

CONCLUSION:

Results indicated that 94% of CLBP patients could be classified using a MK-C. The most common presentation in CLBP was facet joint syndrome. Age, RM and MSPQ appeared to be distinguishing characteristics of this population. Future studies should be conducted to establish the validity and reliability of the MK-C.

45 D. MANUAL THERAPY EXTREMITIES**Sprained ankle**

Man Ther. 2016 Dec;26:141-149. doi: 10.1016/j.math.2016.08.006. Epub 2016 Aug 29.

Manual therapy in joint and nerve structures combined with exercises in the treatment of recurrent ankle sprains: A randomized, controlled trial.

Plaza-Manzano G¹, Vergara-Vila M², Val-Otero S³, Rivera-Prieto C⁴, Pecos-Martin D⁵, Gallego-Izquierdo T⁶, Ferragut-Garcías A⁷, Romero-Franco N⁸.

BACKGROUND:

Recurrent ankle sprains often involve residual symptoms for which subjects often perform proprioceptive or/and strengthening exercises. However, the effectiveness of mobilization to influence important nerve structures due to its anatomical distribution like tibial and peroneal nerves is unclear.

OBJETIVES:

To analyze the effects of proprioceptive/strengthening exercises versus the same exercises and manual therapy including mobilizations to influence joint and nerve structures in the management of recurrent ankle sprains.

STUDY DESIGN:

A randomized single-blind controlled clinical trial.

METHOD:

Fifty-six patients with recurrent ankle sprains and regular sports practice were randomly assigned to experimental or control group. The control group performed 4 weeks of proprioceptive/strengthening exercises; the experimental group performed 4 weeks of the same exercises combined with manual therapy (mobilizations to influence joint and nerve structures). Pain, self-reported functional ankle instability, pressure pain threshold (PPT), ankle muscle strength, and active range of motion (ROM) were evaluated in the ankle joint before, just after and one month after the interventions.

RESULTS:

The within-group differences revealed improvements in all of the variables in both groups throughout the time. Between-group differences revealed that the experimental group exhibited lower pain levels and self-reported functional ankle instability and higher PPT, ankle muscle strength and ROM values compared to the control group immediately after the interventions and one month later.

CONCLUSIONS:

A protocol involving proprioceptive and strengthening exercises and manual therapy (mobilizations to influence joint and nerve structures) resulted in greater improvements in pain, self-reported functional joint stability, strength and ROM compared to exercises alone.

OA hip MT

Clin Rehabil. 2016 Dec;30(12):1141-1155. Epub 2015 Dec 22.

The effects of manual therapy or exercise therapy or both in people with hip osteoarthritis: a systematic review and meta-analysis.

Sampath KK¹, Mani R², Miyamori T², Tumilty S².

OBJECTIVE:

To determine whether manual therapy or exercise therapy or both is beneficial for people with hip osteoarthritis in terms of reduced pain, improved physical function and improved quality of life.

METHODS:

Databases such as Medline, AMED, EMBASE, CINAHL, SPORTSDiscus, PubMed, Cochrane Library, Web of Science, Physiotherapy Evidence Database, and SCOPUS were searched from their inception till September 2015. Two authors independently extracted and assessed the risk of bias in included studies. Standardised mean differences for outcome measures (pain, physical function and quality of life) were used to calculate effect sizes. The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach was used for assessing the quality of the body of evidence for each outcome of interest.

RESULTS:

Seven trials (886 participants) that met the inclusion criteria were included in the meta-analysis. There was high quality evidence that exercise therapy was beneficial at post-treatment (pain-SMD-0.27,95%CI-0.5to-0.04;physical function-SMD-0.29,95%CI-0.47to-0.11) and follow-up (pain-SMD-0.24,95%CI- 0.41to-0.06; physical function-SMD-0.33,95%CI-0.5to-0.15). There was low quality evidence that manual therapy was beneficial at post-treatment (pain-SMD-0.71,95%CI-1.08to-0.33; physical function-SMD-0.71,95%CI-1.08to-0.33) and follow-up (pain-SMD-0.43,95%CI-0.8to-0.06; physical function-SMD-0.47,95%CI-0.84to-0.1). Low quality evidence indicated that combined treatment was beneficial at post-treatment (pain-SMD-0.43,95%CI-0.78to-0.08; physical function-SMD-0.38,95%CI-0.73to-0.04) but not at follow-up (pain-SMD0.25,95%CI-0.35to0.84; physical function-SMD0.09,95%CI-0.5to0.68). There was no effect of any interventions on quality of life.

CONCLUSION:

An Exercise therapy intervention provides short-term as well as long-term benefits in terms of reduction in pain, and improvement in physical function among people with hip osteoarthritis. The observed magnitude of the treatment effect would be considered small to moderate.

Knee manual therapy

Musculoskeletal Care. 2016 Nov 18. doi: 10.1002/msc.1166.

Treatment effectiveness and fidelity of manual therapy to the knee: A systematic review and meta-analysis.

Salamh P¹, Cook C¹, Reiman MP¹, Sheets C².

Manual therapy (MT) is a commonly used treatment for knee osteoarthritis (OA) but to date only one systematic review has explored its effectiveness. T

he purpose of the present study was to perform a systematic review and meta-analysis of the literature, to determine the effectiveness and fidelity of studies using MT techniques in individuals with knee OA. Relevant studies were assessed for inclusion. Effectiveness was measured using effect sizes, and methodological bias and treatment fidelity were both explored. Effect sizes were calculated using standardized mean differences (SMD) based on pooled data depending on statistical and clinical heterogeneity, as well as risk of bias. The search captured 2,969 studies; after screening, 12 were included. Four had a low risk of bias and high treatment fidelity. For self-reported function, comparing MT with no treatment resulted in a large effect size (standardized mean difference [SMD] 0.84), as did adding MT to a comparator treatment (SMD 0.78). A significant difference was found for pain when adding MT to a comparator treatment (SMD 0.73).

The findings in the present meta-analytical review support the use of MT versus a number of different comparators for improvement in self-reported knee function. Lesser support is present for pain reduction, and no endorsement of functional performance can be made at this time.

46 A. UPPER LIMB NEUROMOBILIZATION**Neural glides in CTS**

J Manipulative Physiol Ther. 2016 Nov 11. pii: S0161-4754(16)30246-9. doi: 10.1016/j.jmpt.2016.10.004.

Effectiveness of Nerve Gliding Exercises on Carpal Tunnel Syndrome: A Systematic Review.

Ballester-Pérez R¹, Plaza-Manzano G², Urraca-Gesto A³, Romo-Romo F³, Atín-Arratibel ML¹, Pecos-Martín D⁴, Gallego-Izquierdo T⁴, Romero-Franco N⁵.

OBJECTIVE:

The objective of this study was to review the literature regarding the effectiveness of neural gliding exercises for the management of carpal tunnel syndrome (CTS).

METHODS:

A computer-based search was completed through May 2014 in PubMed, Physiotherapy Evidence Database (PEDro), Web of Knowledge, Cochrane Plus, and CINAHL. The following key words were included: nerve tissue, gliding, exercises, carpal tunnel syndrome, neural mobilization, and neurodynamic mobilization. Thirteen clinical trials met the inclusion/exclusion criteria, which were: nerve gliding exercise management of participants aged 18 years or older; clinical or electrophysiological diagnostics of CTS; no prior surgical treatment; and absence of systemic diseases, degenerative joint diseases, musculoskeletal affectations in upper limbs or spine, or pregnancy. All studies were independently appraised using the PEDro scale.

RESULTS:

The majority of studies reported improvements in pain, pressure pain threshold, and function of CTS patients after nerve gliding, combined or not with additional therapies. When comparing nerve gliding with other therapies, 2 studies reported better results from standard care and 1 from use of a wrist splint, whereas 3 studies reported greater and earlier pain relief and function after nerve gliding in comparison with conservative techniques, such as ultrasound and wrist splint. However, 6 of the 13 studies had a quality of 5 of 11 or less according to the PEDro scale.

CONCLUSION:

Limited evidence is available on the effectiveness of neural gliding. Standard conservative care seems to be the most appropriate option for pain relief, although neural gliding might be a complementary option to accelerate recovery of function. More high-quality research is still necessary to determine its effectiveness and the subgroups of patients who may respond better to this treatment.

47. STRETCHING/MUSCLES**Musculotendinous junction and exercise**

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

48 A. STM**Active and passive STM**

J Chiropr Med. 2016 Dec;15(4):235-242. Epub 2016 Oct 11.

Comparison Between the Effects of Passive and Active Soft Tissue Therapies on Latent Trigger Points of Upper Trapezius Muscle in Women: Single-Blind, Randomized Clinical Trial.

Kojidi MM¹, Okhovatian F², Rahimi A², Baghban AA², Azimi H³.

OBJECTIVE:

The purpose of this study was to investigate the effects of passive versus active soft tissue therapies on pain and ranges of motion in women with latent myofascial trigger points.

METHODS:

Forty-two female patients, aged 18 to 64 years, with a history of neck pain and latent myofascial trigger points in the upper trapezius muscle were randomly assigned to 3 groups: group A received passive soft tissue therapy, group B received active soft tissue therapy, and a control group C received a sham procedure. The treatment consisted of 3 sessions in a 1-week period with 1-day break between each session. The local pain intensity, measured with a visual analog scale and pain pressure threshold (PPT) using algometry, and active cervical contralateral flexion (ACLF) measured with goniometry, were obtained at baseline, after the third session, and a week after the third session.

RESULTS:

The results indicated a significant decrease in local pain intensity on the visual analog scale within each group (A and B) compared with the control group (C) ($P < .05$). The passive group had significant improvement in PPT compared with the control group ($P < .05$). There were no significant differences in ACLF after treatment between the 3 groups ($P > .05$).

CONCLUSION:

Both passive and active soft tissue therapies were determined to reduce pain intensity and increase ACLF range of motion, although passive therapy was more effective in increasing PPT in these patients compared with the control group.

48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE**Infraspinatus**

Man Ther. 2016 Dec;26:62-69. doi: 10.1016/j.math.2016.07.009. Epub 2016 Jul 21.

Effects of dry needling to the symptomatic versus control shoulder in patients with unilateral subacromial pain syndrome.

Koppenhaver S¹, Embry R², Ciccarello J², Waltrip J², Pike R², Walker M³, Fernández-de-Las-Peñas C⁴, Croy T², Flynn T³.

BACKGROUND:

Initial reports suggest that treating myofascial trigger points in the infraspinatus with dry needling may be effective in treating patients with shoulder pain. However, to date, high quality clinical trials and thorough knowledge of the physiologic mechanisms involved is lacking.

OBJECTIVES:

To examine the effect of dry needling to the infraspinatus muscle on muscle function, nociceptive sensitivity, and shoulder range of motion (ROM) in the symptomatic and asymptomatic shoulders of individuals with unilateral subacromial pain syndrome.

DESIGN:

Within-subjects controlled trial.

METHODS:

Fifty-seven volunteers with unilateral subacromial pain syndrome underwent one session of dry needling to bilateral infraspinatus muscles. Outcome assessments, including ultrasonic measures of infraspinatus muscle thickness, pressure algometry, shoulder internal rotation and horizontal adduction ROM, and questionnaires regarding pain and related disability were taken at baseline, immediately after dry needling, and 3-4 days later.

RESULTS:

Participants experienced statistically significant and clinically relevant changes in all self-report measures. Pressure pain threshold and ROM significantly increased 3-4 days, but not immediately after dry needling only in the symptomatic shoulder [Pressure pain threshold: 5.1 (2.2, 8.0) N/cm², internal rotation ROM: 9.6 (5.0, 14.1) degrees, horizontal adduction ROM: 5.9 (2.5, 9.4) degrees]. No significant changes occurred in resting or contracted infraspinatus muscle thickness in either shoulder.

CONCLUSIONS:

This study found changes in shoulder ROM and pain sensitivity, but not in muscle function, after dry needling to the infraspinatus muscle in participants with unilateral subacromial pain syndrome. These changes generally occurred 3-4 days after dry needling and only in the symptomatic shoulders.

Dry needling and hamstrings

J Sport Rehabil. 2016 Nov 11:1-31

Clinical Effects of Dry Needling Among Asymptomatic Individuals With Hamstring Tightness: A Randomized Controlled Trial.

Geist K¹, Bradley C¹, Hofman A¹, Koester R¹, Roche F¹, Shields A¹, Frierson E¹, Rossi A¹, Johanson M¹.

STUDY DESIGN:

Randomized controlled trial.

OBJECTIVES:

The aim of this study was to determine the effects of dry needling on hamstring extensibility and functional performance tests among asymptomatic individuals with hamstring muscle tightness.

BACKGROUND:

Dry needling has been shown to increase range of motion in the upper quarter and may have similar effects in the lower quarter.

METHODS:

Twenty-seven subjects with hamstring extensibility deficits were randomly assigned to side of treatment (dominant or non-dominant) and group (blunt needling or dry needling). The first session included measurement of hamstring extensibility and performance on four unilateral hop tests, instruction in home hamstring stretching exercises and needling distal to the ischial tuberosity and mid-bellies of the medial and lateral hamstrings. A second session, 3-5 days following the first session included outcome measures and a second needling intervention, and a third session, 4-6 weeks following the first session included outcome measures only. A 2x3x2 ANOVA was used to statistically analyze the data.

RESULTS:

Hamstring extensibility showed a significant side x time interaction ($p < .05$). The single hop for distance, timed six meter hop, and the crossover hop test had a significant main effect of time ($p < .05$). The triple hop for distance showed a significant side x time x group interaction ($p < .05$).

CONCLUSIONS:

It does not appear dry needling results in increased extensibility beyond that of stretching alone in asymptomatic individuals. Our study findings suggest that dry needling may improve certain dimensions of functional performance, although no clear conclusion can be made

52. EXERCISE**QOL and ex and diet**

Health Qual Life Outcomes. 2016 Dec 7;14(1):169.

Diet and physical activity in people with intermediate cardiovascular risk and their relationship with the health-related quality of life: results from the MARK study.

Sanchez-Aguadero N¹, Alonso-Dominguez R², Garcia-Ortiz L^{2,3}, Agudo-Conde C², Rodriguez-Martin C², de Cabo-Laso A², Sanchez-Salgado B², Ramos R⁴, Maderuelo-Fernandez JA², Gomez-Marcos MA^{2,5}, Recio-Rodriguez JJ^{2,6}; MARK Group.

BACKGROUND:

To analyze the interplay between diet, physical activity and health-related quality of life in a Spanish randomly selected sample of individuals attended in general practitioners offices with intermediate cardiovascular risk.

METHODS:

This study analyzed 314 subjects, aged 35-74 years (50.6% women), from the MARK study, conducted in Spain. Health related quality of life was measured by the SF-12 questionnaire. The assessment of the lifestyles included the diet quality index, the adherence to the Mediterranean diet and the leisure time physical activity practice.

RESULTS:

The highest values of health related quality of life were obtained in the area of vitality (51.05 ± 11.13), while the lowest were found in the general health (39.89 ± 8.85). In the multiple linear regression analysis, after adjustment for age, gender and other confounders, for each point of increase in the Mediterranean diet adherence score, there was an increase of 1.177 points in the mental component value ($p < 0.01$). Similarly, for each point of increase in the Diet Quality Index Score, there was an increase in the mental component of 0.553 ($p < 0.05$). Likewise, the physical activity was positively associated with the physical function and vitality ($\beta = 0.090$ and 0.087 , ($p < 0.01$ and $p < 0.05$), respectively).

CONCLUSIONS:

In people with intermediate cardiovascular risk, better food habits and greater adherence to the Mediterranean diet are associated with higher scores on the mental component of quality of life. Likewise, increased physical activity is related with positive scores on the physical function.

Patient involvement in program

Physiotherapy. 2016 Dec;102(4):332-338. doi: 10.1016/j.physio.2015.05.004. Epub 2015 Jun 6.

Exercise prescription for patients with non-specific chronic low back pain: a qualitative exploration of decision making in physiotherapy practice.

Stenner R¹, Swinkels A², Mitchell T³, Palmer S⁴.

BACKGROUND:

Providing an effective exercise prescription process for patients with non-specific chronic low back pain (NSCLBP) is a challenging task. Emerging research has indicated that partnership in care and shared decision making are important for people with NSCLBP and calls for further investigation into the approaches used to prescribe exercise.

OBJECTIVE:

To explore how shared decision making and patient partnership are addressed by physiotherapists in the process of exercise prescription for patients with NSCLBP.

DESIGN:

A qualitative study using a philosophical hermeneutic approach.

METHODS:

Eight physiotherapists were each observed on three occasions undertaking their usual clinical activities (total n=24 observations). They conducted brief interviews after each observation and a later in depth semi-structured interview. Iterative hermeneutic strategies were used to interpret the texts and identify the characteristics and processes of exercise prescription for patients with NSCLBP.

FINDINGS:

The findings revealed how physiotherapy practice often resulted in unequal possibilities for patient participation which were in turn linked to the physiotherapists' assumptions about the patients, clinical orientation, cognitive and decision making processes. Three linked themes emerged: (1) I want them to exercise, (2) which exercise? - the tension between evidence and everyday practice and (3) compliance-orientated more than concordance based.

CONCLUSIONS:

This research, by focusing on a patient-centred approach, makes an important contribution to the body of evidence relating to the management of NSCLBP. It challenges physiotherapists to critically appraise their approaches to the prescription of exercise therapy in order to improve outcomes for these patients

57. GAIT**Virtual gait and LBP**

Eur Spine J. 2016 Dec 15.

Is physiotherapy integrated virtual walking effective on pain, function, and kinesiophobia in patients with non-specific low-back pain? Randomised controlled trial.

Yilmaz Yelvar GD¹, Çırak Y², Dalkılıç M², Parlak Demir Y², Guner Z², Boydak A².

PURPOSE:

According to literature, virtual reality was found to reduce pain and kinesiophobia in patients with chronic pain. The purpose of the study was to investigate short-term effect of the virtual reality on pain, function, and kinesiophobia in patients with subacute and chronic non-specific low-back pain **METHODS:** This randomised controlled study in which 44 patients were randomly assigned to the traditional physiotherapy (control group, 22 subjects) or virtual walking integrated physiotherapy (experimental group, 22 subjects). Before and after treatment, Visual Analog Scale (VAS), TAMPA Kinesiophobia Scale (TKS), Oswestry Disability Index (ODI), Nottingham Health Profile (NHP), Timed-up and go Test (TUG), 6-Minute Walk Test (6MWT), and Single-Leg Balance Test were assessed. The interaction effect between group and time was assessed by using repeated-measures analysis of covariance.

RESULTS:

After treatment, both groups showed improvement in all parameters. However, VAS, TKS, TUG, and 6MWT scores showed significant differences in favor of the experimental group.

CONCLUSION:

Virtual walking integrated physiotherapy reduces pain and kinesiophobia, and improved function in patients with subacute and chronic non-specific low-back pain in short term.

59. PAIN**Sympathy, empathy and compassion**

December 2016 Volume 52, Issue 6, Pages e147–e148

P318 Peeling the Onion: Patients' Perspectives and Experiences of the Similarities and Differences of Sympathy, Empathy and Compassion

Shane Sinclair Thomas F. Hack Susan McClement Shelley Raffin-Bouchal

DOI: <http://dx.doi.org/10.1016/j.jpainsymman.2016.10.330>

Objectives

This presentation reports on palliative care patients' perspectives and experiences of sympathy, empathy and compassion stemming from a larger grounded theory study focused on compassion. An overview of how these constructs have been employed in the healthcare literature will be provided to orientate audience members to the topic.

Methods

After completing a literature review of these constructs within the healthcare literature, we conducted semi-structured, face-to-face interviews with 53 palliative care patients to elicit their experiences and understandings of sympathy, empathy and compassion using grounded theory. Patients were recruited from a large acute teaching hospital in Western Canada over a 9 month period, with the research team independently and collectively analyzing data in accordance with the three stages of Straussian grounded theory.

Results

Each of the three categories contained several distinct themes. Patients identified sympathy as a pity-based response rooted in a lack of understanding, intended to primarily serve the needs of the observer. Empathy was a more personalized response based in an understanding of the person's needs and an affective response on the part of the respondent. Compassion was described as a virtuous response that seeks to address the suffering and needs of a person through relational understanding and action.

Conclusions

Patients perspectives and preferences related to sympathy, empathy, and compassion are important to a patient-centred approach to palliative care. Delineating between these constructs is also foundational to clinical training and research, where these terms are typically conflated and lack specificity.

Adolescent pain and anxiety**Long-term adolescent multi-site musculoskeletal pain is associated with psychological distress and anxiety**

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Highlights

- Adolescents with long-term multi-site pain have elevated distress and anxiety.
- Multi-site musculoskeletal pain is more common among girls compared to boys.
- The results suggest a gender difference in the association between distress and pain.

Abstract**Objective**

Although several studies have shown that adolescent musculoskeletal pain is associated with psychological problems in a cross-sectional setting, the associations of long-term musculoskeletal pain with psychological distress and anxiety are not known.

Methods

The study included 1773 adolescents belonging to the Northern Finland Birth Cohort 1986. They received a postal questionnaire at the age of 16 years and a follow-up questionnaire two years later. The first inquiry contained questions about the sites of musculoskeletal pain; the second had the same pain questions, along with measures of distress and anxiety. Risk ratios (RR) were assessed by log-linear regression analysis.

Results

Multi-site musculoskeletal pain (in ≥ 2 body locations) at both 16 and 18 years was common, reported by 53% of girls and 30% of boys. Multi-site pain at both ages, compared to those with multi-site pain neither at 16 nor 18 years, was associated with psychological distress at the age of 18 among both girls (RR 1.8 95% CI 1.2–2.7) and boys (RR 3.5 95% CI 2.1–5.9). For anxiety, the corresponding relative risks were 1.5 (95% CI 1.0–2.2) and 1.8 (95% CI 1.4–2.3), respectively. For short-term multi-site pain (prevalent only at the age of 16 or 18), these relative risks were between 0.8 and 2.3.

Conclusions

Adolescents with long-term multi-site pain have higher levels of distress and anxiety than those without or with only short-term multi-site pain. Associations were found in both genders, but the relationship between pain and distress was more pronounced among boys. The associations had modest effect strength.

Facial expressions

J Pain. 2016 Dec 2. pii: S1526-5900(16)30336-4. doi: 10.1016/j.jpain.2016.11.011.

Understanding facial expressions of pain in patients with depression.

Lautenbacher S¹, Bär KJ², Eisold P², Kunz M³.

Although depression is associated with more clinical pain complaints, psychophysical data sometimes point to hypoalgesic alterations.

Studying the more reflex-like facial expression of pain in patients with depression may offer a new perspective. Facial and psychophysical responses to non-painful and painful heat stimuli were studied in 23 patients with major depressive disorder (MDD) and 23 matched controls. As psychophysical data, pain thresholds, tolerance thresholds and self-report were assessed. Facial responses were videotaped and subjected offline to FACS (Facial Action Coding System) analysis. One of the key facial responses of pain, which is a known facial signal of negative affect (contraction of the eyebrows), was significantly increased in MDD patients. Moreover, facial expressions and pain ratings were strongly correlated in MDD patients, whereas these two response systems were - in line with established findings - only weakly related in healthy participants. Pain psychophysics was unaltered in MDD patients in comparison to healthy controls.

In conclusion, the facial expression of pain in MDD patients indicates rather hyper- than hypoalgesia, with enhanced affective pain processing. Moreover, the linkage between subjective and facial responses was much stronger in MDD patients, which may be due to a reduced influence of social display rules, which normally complicate this relationship.

PERSPECTIVE:

The facial expression of pain in patients with depression indicates stronger affective pain processing and stronger association with self-report than in healthy individuals.

62 A. NUTRITION/VITAMINS**Vit D and asthma****25-hydroxyvitamin D concentrations, asthma and eczema in childhood: The Generation R Study**

Clinical Nutrition, 12/09/2016

Tromp IIM, et al.

This study was conducted to analyze whether serum 25-hydroxyvitamin D (25(OH) vitamin D) concentrations are connected with the fraction of exhaled nitric oxide (FeNO), airway interrupter resistance (Rint), physician diagnosed asthma ever, wheezing and eczema in a population-based cohort study. The findings demonstrate that lower 25(OH) vitamin D levels are related to elevated FeNO levels, but lower Rint values. Lower 25(OH) vitamin D levels are also connected with a diminished risk for asthma diagnoses but an increased risk for eczema.

Methods

- For this study, serum 25(OH) vitamin D concentration was surveyed in 3815 children.
- After that, 25(OH) vitamin D concentrations ≥ 75 nmol/L were considered as sufficient, between 50-75nmol/L as insufficient, and < 50 nmol/L as deficient.
- FeNO and Rint were measured at the research center.
- Information on physician diagnosed asthma, wheezing, and eczema were acquired by parent-reported questionnaires.

Results

- Researchers observed that in comparison with sufficient 25(OH) vitamin D concentration, deficient concentrations were connected with elevated FeNO of ≥ 25 ppb (OR:2.54;95%CI: 1.34-4.80).
- Also, deficient and insufficient 25(OH) vitamin D concentrations were connected with a lower Rint (Z-score:-1.26;95%CI: -1.66- -0.85) (β :-0.75;95%CI: -1.08- -0.42), and expanded risks of eczema (OR:1.65;95%CI:1.13-2.41) (OR:1.44;95%CI: 1.06-1.95).
- Finally, insufficient 25(OH) vitamin D concentration were connected with a diminished risk of physician diagnosed asthma ever (OR:0.59;95%CI:0.38-0.94).

Vit D 3 amount

Osteoporos Int. 2016 Dec 16.

Optimum dose of vitamin D for disease prevention in older people: BEST-D trial of vitamin D in primary care.

Hin H¹, Tomson J², Newman C³, Kurien R², Lay M², Cox J², Sayer J², Hill M², Emberson J², Armitage J², Clarke R⁴.

This trial compared the effects of daily treatment with vitamin D or placebo for 1 year on blood tests of vitamin D status. The results demonstrated that daily 4000 IU vitamin D3 is required to achieve blood levels associated with lowest disease risks, and this dose should be tested in future trials for fracture prevention.

INTRODUCTION:

The aim of this trial was to assess the effects of daily supplementation with vitamin D3 4000 IU (100 µg), 2000 IU (50 µg) or placebo for 1 year on biochemical markers of vitamin D status in preparation for a large trial for prevention of fractures and other outcomes.

METHODS:

This is a randomized placebo-controlled trial in 305 community-dwelling people aged 65 years or older in Oxfordshire, UK. Outcomes included biochemical markers of vitamin D status (plasma 25-hydroxy-vitamin D [25(OH)D], parathyroid hormone [PTH], calcium and alkaline phosphatase), cardiovascular risk factors and tests of physical function.

RESULTS:

Mean (SD) plasma 25(OH)D levels were 50 (18) nmol/L at baseline and increased to 137 (39), 102 (25) and 53 (16) nmol/L after 12 months in those allocated 4000 IU, 2000 IU or placebo, respectively (with 88%, 70% and 1% of these groups achieving the pre-specified level of >90 nmol/L). Neither dose of vitamin D3 was associated with significant deviation outside the normal range of PTH or albumin-corrected calcium. The additional effect on 25(OH)D levels of 4000 versus 2000 IU was similar in all subgroups except for body mass index, for which the further increase was smaller in overweight and obese participants compared with normal-weight participants. Supplementation with vitamin D had no significant effects on cardiovascular risk factors or on measures of physical function.

CONCLUSIONS:

After accounting for average 70% compliance in long-term trials, doses of 4000 IU vitamin D3 daily may be required to achieve plasma 25(OH)D levels associated with lowest disease risk in observational studies.

KEYWORDS:

Clinical trial; Markers of vitamin D status; Optimum dose; Vitamin D

Magnesium and health

BMC Med. 2016 Dec 8;14(1):210.

Dietary magnesium intake and the risk of cardiovascular disease, type 2 diabetes, and all-cause mortality: a dose-response meta-analysis of prospective cohort studies.

Fang X¹, Wang K², Han D¹, He X¹, Wei J¹, Zhao L¹, Imam MU³, Ping Z³, Li Y⁴, Xu Y⁴, Min J², Wang F^{5,6}.

BACKGROUND:

Although studies have examined the association between dietary magnesium intake and health outcome, the results are inconclusive. Here, we conducted a dose-response meta-analysis of prospective cohort studies in order to investigate the correlation between magnesium intake and the risk of cardiovascular disease (CVD), type 2 diabetes (T2D), and all-cause mortality.

METHODS:

PubMed, EMBASE, and Web of Science were searched for articles that contained risk estimates for the outcomes of interest and were published through May 31, 2016. The pooled results were analyzed using a random-effects model.

RESULTS:

Forty prospective cohort studies totaling more than 1 million participants were included in the analysis. During the follow-up periods (ranging from 4 to 30 years), 7678 cases of CVD, 6845 cases of coronary heart disease (CHD), 701 cases of heart failure, 14,755 cases of stroke, 26,299 cases of T2D, and 10,983 deaths were reported. No significant association was observed between increasing dietary magnesium intake (per 100 mg/day increment) and the risk of total CVD (RR: 0.99; 95% CI, 0.88-1.10) or CHD (RR: 0.92; 95% CI, 0.85-1.01). However, the same incremental increase in magnesium intake was associated with a 22% reduction in the risk of heart failure (RR: 0.78; 95% CI, 0.69-0.89) and a 7% reduction in the risk of stroke (RR: 0.93; 95% CI, 0.89-0.97). Moreover, the summary relative risks of T2D and mortality per 100 mg/day increment in magnesium intake were 0.81 (95% CI, 0.77-0.86) and 0.90 (95% CI, 0.81-0.99), respectively.

CONCLUSIONS:

Increasing dietary magnesium intake is associated with a reduced risk of stroke, heart failure, diabetes, and all-cause mortality, but not CHD or total CVD. These findings support the notion that increasing dietary magnesium might provide health benefits.

Vit D and frailty

Osteoporos Int. 2016 Dec 15.

Vitamin D deficiency is associated with functional decline and falls in frail elderly women despite supplementation.

Kotlarczyk MP¹, Perera S^{2,3}, Ferchak MA², Nace DA², Resnick NM², Greenspan SL^{2,4}.

We examined the impact of daily supplementation on vitamin D deficiency, function, and falls in female long-term care residents. Initial vitamin D deficiency was associated with greater functional decline and increased fall risk despite guideline-recommended supplementation, highlighting the importance of preventing vitamin D deficiency in frail elderly.

INTRODUCTION:

Institute of Medicine (IOM) guidelines recommend 800 IU vitamin D daily for older adults and maintaining serum 25-hydroxyvitamin D [25(OH) D] above 20 ng/ml for optimal skeletal health. The adequacy of IOM guidelines for sustaining function and reducing falls in frail elderly is unknown.

METHODS:

Female long-term care residents aged ≥ 65 enrolled in an osteoporosis clinical trial were included in this analysis (n = 137). Participants were classified based on baseline 25(OH) D levels as deficient (<20 ng/ml, n = 26), insufficient (20-30 ng/ml, n = 40), or sufficient (>30 ng/ml, n = 71). Deficient women were provided initial vitamin D repletion (50,000 IU D₃ weekly for 8 weeks). All were supplemented with 800 IU vitamin D₃ daily for 24 months. Annual functional assessments included Activities of Daily Living (ADLs), Instrumental ADL (IADL), physical performance test (PPT), gait speed, cognition (SPMSQ), and mental health (PHQ-9). We used linear mixed models for analysis of functional measures and logistic regression for falls.

RESULTS:

Daily supplementation maintained 25(OH) D levels above 20 ng/ml in 95% of participants. All groups demonstrated functional decline. Women initially deficient had a greater decline in physical function at 12 (IADL -2.0 ± 0.4 , PPT -3.1 ± 0.7 , both $p < 0.01$) and 24 months (IADL -2.5 ± 0.6 , ADL -2.5 ± 0.6 , both $p < 0.01$), a larger increase in cognitive deficits at 12 months (1.7 ± 0.4 ; $p = 0.01$) and more fallers (88.5%, $p = 0.04$) compared to those sufficient at baseline, despite supplementation to sufficient levels.

CONCLUSIONS:

IOM guidelines may not be adequate for frail elderly. Further study of optimal 25(OH) D levels for maintaining function and preventing falls is needed.

KEYWORDS:

25-hydroxyvitamin D; Deficiency; Falls; Frail elderly; Long-term care; Vitamin D

63. PHARMACOLOGY**Hearing loss with pain killers****Longer use of pain relievers associated with hearing loss in women**

Brigham and Women's Hospital, 12/19/2016

As many as two-thirds of women in the United States over the age of 60 have some degree of hearing loss. Using data from the Nurses' Health Study, a team led by researchers from Brigham and Women's Hospital has found evidence that the duration of use of over-the-counter medications for pain relief, including ibuprofen or acetaminophen, is associated with higher risk of hearing loss.

The new study, published on Dec. 14 in the American Journal of Epidemiology adds to a growing body of evidence linking the use of non-steroidal anti-inflammatory drugs (NSAIDs) or acetaminophen with loss of hearing, although the exact mechanism at play remains unknown.

The research team examined data from more than 54,000 women between the ages of 48 and 73 enrolled in the Nurses' Health Study. They analyzed information on usage of aspirin, ibuprofen and acetaminophen, as well as self-reported hearing loss.

Longer duration of ibuprofen or acetaminophen use was associated with higher risk of hearing loss. The team did not find a significant association between hearing loss and duration of usual-dose aspirin use. (Hearing loss is an established side effect of high dosages of aspirin, but such dosages have become uncommon over the last two decades.)

“Although the magnitude of higher risk of hearing loss with analgesic use was modest, given how commonly these medications are used, even a small increase in risk could have important health implications. Assuming causality, this would mean that approximately 16.2 percent of hearing loss occurring in these women could be due to ibuprofen or acetaminophen use,” said Curhan. The study's authors note that the NHS data are limited to mostly older, white women and that further investigation in larger groups and among other populations will be important to understand the connection between hearing loss and pain reliever usage. The team has previously published findings that indicate that higher frequency use of NSAIDs and acetaminophen are associated with higher risk of hearing loss in men and younger women.