2. LBP

Aberrant vertebral moiton

European Spine Journal pp 1–9|

Aberrant intervertebral motion in patients with treatment-resistant nonspecific low back pain: a retrospective cohort study and control comparison

- Alexander Breen Fiona Mellor Alan Breen

Purpose

Intervertebral kinematic assessments have been used to investigate mechanical causes when back pain is resistant to treatment, and recent studies have identified intervertebral motion markers that discriminate patients from controls. However, such patients are a heterogeneous group, some of whom have structural disruption, but the effects of this on intervertebral kinematics are unknown.

Methods

Thirty-seven patients with treatment-resistant back pain referred for quantitative fluoroscopy were matched to an equal number of pain-free controls for age and sex. All received passive recumbent flexion assessments for intervertebral motion sharing inequality (MSI), variability (MSV), laxity and translation. Comparisons were made between patient subgroups, between patients and controls and against normative levels from a separate group of controls.

Results

Eleven patients had had surgical or interventional procedures, and ten had spondylolisthesis or pars defects. Sixteen had no disruption. Patients had significantly higher median MSI values (0.30) than controls (0.27, $p = 0.010$), but not MSV (patients 0.08 vs controls 0.08, $p = 0.791$). Patients who received invasive procedures had higher median MSI values (0.37) than those with bony defects (0.30, $p = 0.018$) or no disruption (0.28, $p = 0.0007$). Laxity and translation above reference limits were not more prevalent in patients.

Conclusion

Patients with treatment-resistant nonspecific back pain have greater MSI values than controls, especially if the former have received spinal surgery. However, excessive laxity, translation and MSV are not more prevalent in these patients. Thus, MSI should be investigated as a pain mechanism and for its possible value as a prognostic factor and/or target for treatment in larger patient populations.

5. SURGERY

Rehab post fusion time line

Spine (Phila Pa 1976). 2012 Oct 1;37(21):1803-9.

The effect of early initiation of rehabilitation after lumbar spinal fusion: a randomized clinical study.

Oestergaard LG[1], Nielsen CV, Bünger CE, Sogaard R, Fruensgaard S, Helmig P, Christensen FB.

STUDY DESIGN:
A multicenter randomized clinical trial including 82 patients.

OBJECTIVE:
To examine the effect of early initiation of rehabilitation after instrumented lumbar spinal fusion.

SUMMARY OF BACKGROUND DATA:
Lumbar spinal fusion has been performed for more than 70 years. Yet, few studies have examined patients' subsequent rehabilitation. Group-based rehabilitation is both efficient and cost-effective in rehabilitation of lumbar spinal fusion patients.

METHODS:
Patients with degenerative disc diseases undergoing instrumented lumbar spinal fusion were randomly assigned to initiate their rehabilitation 6 weeks (6-wk group) or 12 weeks after lumbar spinal fusion (12-wk group). Both groups received the same group-based rehabilitation. Primary outcome was the Oswestry Disability Index. Secondary outcome was the Dallas Pain Questionnaire, the Low Back Pain Rating Scale, and absence from work. Wilcoxon rank-sum test was used to compare the groups in terms of differences from baseline to 6 months and 1-year follow-up. Results are presented in median with 25th and 75th percentiles.

RESULTS:
According to the Oswestry Disability Index, at 1-year follow-up, the 6-week-group had a median reduction of -6 (-19; 4) compared with -20 (-30;-7) in the 12-week group (P, 0.05). The Dallas Pain Questionnaire showed overall the same tendency, and within daily activities were significantly reduced in favor of the 12-week group (P, 0.05). For back pain, the 6-week group had a median reduction of -2.2 (-3.0; -0.7) similar with -3.3 (-4.7; -1.7) in the 12-week group (P, 0.05). The results at 6 months of follow-up were similar. No difference was found according to return to work 1 year postsurgery.

CONCLUSION:
Early start of rehabilitation (6 wk vs. 12 wk) after lumbar spinal fusion resulted in inferior outcomes. The improvements in the 12-week group were 4 times better than that in the 6-week group, indicating that the start-up time of rehabilitation is an important contributing factor for the overall outcome.

6. PELVIC GIRDLE

SI Inflammation

Arthritis Rheumatol. 2018 Mar 7. doi: 10.1002/art.40475.

Magnetic Resonance Imaging of the Sacroiliac Joints Indicating Sacroiliitis According to the Assessment of SpondyloArthritis international Society Definition in Healthy Individuals, Runners, and Women With Postpartum Back Pain.

de Winter J[1], de Hooge M[2], van de Sande M[1], de Jong H[1], van Hoeven L[3], de Koning A[4], Berg IJ[5], Ramonda R[6], Baeten D[7], van der Heijde D[4], Weel A[3], Landewé R[8].

OBJECTIVE:
To compare magnetic resonance images (MRIs) of the sacroiliac (SI) joints of healthy subjects and individuals with known mechanical strain acting upon the SI joints to those of patients with axial spondyloarthritis (SpA) and patients with chronic back pain.

METHODS:
Three readers who had received standardized training and were blinded with regard to study group randomly scored MRIs of the SI joints of 172 subjects, including 47 healthy individuals without current or past back pain, 47 axial SpA patients from the Spondyloarthritis Caught Early (SPACE) cohort (with a previous MRI confirmed positive for sacroiliitis), 47 controls with chronic back pain (irrespective of MRI results) from the SPACE cohort, 7 women with postpartum back pain, and 24 frequent runners. MRIs were scored according to the Assessment of SpondyloArthritis international Society (ASAS) definition and Spondyloarthritis Research Consortium of Canada (SPARCC) index.

RESULTS:
Of the 47 healthy volunteers, 11 (23.4%) had an MRI positive for sacroiliitis, compared to 43 (91.5%) of 47 axial SpA patients and 3 (6.4%) of 47 patients with chronic back pain. Three (12.5%) of the 24 runners and 4 (57.1%) of the 7 women with postpartum back pain had a positive MRI. Using a SPARCC cutoff of ≥2 for positivity, 12 (25.5%) of 47 healthy volunteers, 46 (97.9%) of 47 positive axial SpA patients, 5 (10.6%) of 47 controls with chronic back pain, 4 (16.7%) of 24 runners, and 4 (57.1%) of 7 women with postpartum back pain had positive MRIs. Deep bone marrow edema (BME) lesions were not found in healthy volunteers, patients with chronic back pain, or runners, but were found in 42 (89.4%) of 47 positive axial SpA patients and in 1 (14.3%) of 7 women with postpartum back pain.

CONCLUSION:
A substantial proportion of healthy individuals without current or past back pain has an MRI positive for sacroiliitis according to the ASAS definition. Deep (extensive) BME lesions are almost exclusively found in axial SpA patients.

7. PELVIC ORGANS/WOMAN'S HEALTH

NSAID and miscarriage

Am J Obstet Gynecol. 2018 Jun 8. pii: S0002-9378(18)30489-7. doi: 10.1016/j.ajog.2018.06.002.

Use of non-steroidal anti-inflammatory drugs during pregnancy and the risk of miscarriage.

Li DK[1], Ferber JR[2], Odouli R[2], Quesenberry C[2].

BACKGROUND:
Non-steroidal anti-inflammatory drugs (NSAIDs) remain one of the medications most widely used by pregnant women, and previous studies reported an increased risk of miscarriage associated with NSAID use during pregnancy. Although the findings have not always been consistent, there is a well-established mechanism for the association: NSAIDs inhibit the production of prostaglandin, which is essential for successful embryonic implantation. Abnormal implantation increases the risk of miscarriage.

OBJECTIVES: To examine the impact of NSAID use in early pregnancy on the risk of miscarriage, especially regarding the timing and duration of use.
STUDY DESIGN: We conducted a cohort study among pregnant members of Kaiser Permanente Northern California (KPNC), an integrated health care delivery system. Pregnant KPNC members (N=1,097) were recruited very early in pregnancy (median gestational age at enrollment was 39 days) to achieve optimal ascertainment of miscarriage, including early miscarriages, which are often missed in studies of miscarriages. Based on use of NSAIDs and acetaminophen, which has similar indication as NSAIDs, three cohorts were formed: women who used NSAIDs only, women who used acetaminophen only (to control for indication) and women who used neither NSAIDs nor acetaminophen (unexposed controls). Among all eligible women contacted, 63% participated in the study. Miscarriages were ascertained from both electronic medical record data and directly from interviews with participants. The Cox proportional hazards model with accommodation for left truncation was used to examine the risk of miscarriage associated with use of NSAIDs and acetaminophen during pregnancy while controlling for potential confounders.
RESULTS:
After adjusting for multiple confounders including maternal age, previous miscarriage, multivitamin use, caffeine drinking and smoking during pregnancy, NSAID use during pregnancy was associated with a statistically significant increased risk of miscarriage compared to both unexposed controls (adjusted hazard ratio (aHR)=1.59, 95% confidence interval (CI): 1.13 to 2.24) and acetaminophen users (indication controls) (aHR=1.45, 95% CI: 1.01 to 2.08). The risk was largely due to NSAID use around conception (aHR=1.89, 95% CI: 1.31 to 2.71) with a statistically significant dose-response relationship: aHR=1.37 (95% CI: 0.70 to 2.71) for NSAID use of 14 days or less, and aHR=1.85 (95% CI: 1.24 to 2.78) for NSAID use of 15 days or more. The association was stronger for early miscarriage (<8 weeks gestational age): aHR=4.08 (95% CI: 2.25 to 7.41). Women with lower BMI (<25) appeared to be more susceptible to the effect of NSAID use around conception (aHR=3.78, 95% CI: 2.04 to 6.99) than women with high BMI (≥25) (aHR=1.03, 95% CI: 0.61 to 1.72).

CONCLUSION:
After controlling for confounding by indication, NSAID use around conception was associated with increased risk of miscarriage with a dose-response relationship. In addition, women with lower BMI could be especially vulnerable to the effects of NSAID use around the time of embryonic implantation, although this new observation needs to be confirmed in future studies.

Smoking and pregnancy

Volume 6, No. 7, e769–e776, July 2018

National, regional, and global prevalence of smoking during pregnancy in the general population: a systematic review and meta-analysis

Shannon Lange, MPH Charlotte Probst, PhD Prof Jürgen Rehm, PhD Svetlana Popova, PhD

DOI: https://doi.org/10.1016/S2214-109X(18)30223-7

|Background Smoking during pregnancy has been linked to numerous adverse health consequences for both the developing fetus and mother. We estimated the prevalence of smoking during pregnancy by country, WHO region, and globally and the proportion of pregnant women who smoked during pregnancy, by frequency and quantity, on a global level.

Methods For this systematic review and meta-analysis, we did a comprehensive systematic literature search for studies reporting the prevalence of smoking during pregnancy in the general population, published between Jan 1, 1985 and Feb 1, 2016, using several electronic bibliographic databases (CINAHL, Embase, ERIC, Medline, Medline in process, PsychINFO, Scopus, and Web of Science), without language or geographical restrictions. We included original research studies published in a peer-reviewed journal and assessed study quality using a tool specifically developed for use in systematic reviews addressing questions of prevalence. Studies were excluded if they did not include lifetime non-smokers in their sample or estimate, used a sample not generalisable to the general population of the respective country, or did not provide primary data. To estimate the prevalence by country, we did country-specific random-effects meta-analyses for countries with two or more available empirical studies, and we predicted the prevalence using a multilevel fractional response regression model with country-specific indicators for countries with one or no study. We estimated the proportion of female daily smokers who do not quit once pregnant by calculating the regional and global averages of the prevalence of daily smoking during pregnancy and of the prevalence of daily smoking in women. To estimate the global prevalence, by frequency and quantity, we did random-effects meta-analyses using available data from all countries and applied the respective proportions to the global prevalence estimate. We did a time–trend analysis using a univariate multilevel fractional response model.

Findings Of 21 329 studies identified, 295 were retained for data extraction. We calculated estimates via meta-analysis for 43 countries and via statistical modelling for 131 countries. The three countries with the highest estimated prevalence of smoking during pregnancy were Ireland (38·4%, 95% CI 25·4–52·4), Uruguay (29·7%, 16·6–44·8), and Bulgaria (29·4%, 26·6–32·2). The global prevalence of smoking during pregnancy was estimated to be 1·7% (95% CI 0·0–4·5). The prevalence of smoking during pregnancy was 8·1% (95% CI 4·0–12·2) in the European Region, 5·9% (3·2–8·6) in the Region of the Americas, 1·2% (0·7–1·7) in the Southeast Asian Region, 1·2% (0·0–3·7) in the Western Pacific Region, 0·9% (0·0–1·9) in the Eastern Mediterranean Region, and 0·8% (0·0–2·2) in the African Region. Globally, 72·5% (95% CI 70·4–75·0) of pregnant women who smoked were daily smokers, and 27·5% (25·4–29·6) of them were occasional smokers; 51·8% (95% CI 50·0–53·5) women who smoked were light smokers, 34·8% (33·1–36·4) were moderate smokers, and 13·5% (12·3–14·7) were heavy smokers. Furthermore, the proportion of women who smoked daily and continued to smoke daily during pregnancy was 52·9% (95% CI 45·6–60·3), ranging from 30·6% (95% CI 25·6–36·4) in the European Region to 79·6% (44·2–100·0) in the Western Pacific Region.

Interpretation Smoking during pregnancy is still a prevalent behaviour in many countries. These findings should inform smoking prevention programmes and health promotion strategies, as well as draw attention to the need for improved access to smoking cessation programmes for pregnant women.

Alcohol use in pregnancy

Lancet Glob Health. 2017 Mar;5(3):e290-e299. doi: 10.1016/S2214-109X(17)30021-9. Epub 2017 Jan 13.

Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: a systematic review and meta-analysis.

Popova S[1], Lange S[2], Probst C[3], Gmel G[4], Rehm J[5].

BACKGROUND:
Alcohol use during pregnancy is the direct cause of fetal alcohol syndrome (FAS). We aimed to estimate the prevalence of alcohol use during pregnancy and FAS in the general population and, by linking these two indicators, estimate the number of pregnant women that consumed alcohol during pregnancy per one case of FAS.

METHODS:
We began by doing two independent comprehensive systematic literature searches using multiple electronic databases for original quantitative studies that reported the prevalence in the general population of the respective country of alcohol use during pregnancy published from Jan 1, 1984, to June 30, 2014, or the prevalence of FAS published from Nov 1, 1973, to June 30, 2015, in a peer-reviewed journal or scholarly report. Each study on the prevalence of alcohol use during pregnancy was critically appraised using a checklist for observational studies, and each study on the prevalence of FAS was critically appraised by use of a method specifically designed for systematic reviews addressing questions of prevalence. Studies on the prevalence of alcohol use during pregnancy and/or FAS were omitted if they used a sample population not generalisable to the general population of the respective country, reported a pooled estimate by combining several studies, or were published in iteration. Studies that excluded abstainers were also omitted for the prevalence of alcohol use during pregnancy. We then did country-specific random-effects meta-analyses to estimate the pooled prevalence of these indicators. For countries with one or no empirical studies, we predicted prevalence of alcohol use during pregnancy using fractional response regression modelling and prevalence of FAS using a quotient of the average number of women who consumed alcohol during pregnancy per one case of FAS. We used Monte Carlo simulations to derive confidence intervals for the country-specific point estimates of the prevalence of FAS. We estimated WHO regional and global averages of the prevalence of alcohol use during pregnancy and FAS, weighted by the number of livebirths per country. The review protocols for the prevalence of alcohol use during pregnancy (CRD42016033835) and FAS (CRD42016033837) are available on PROSPERO.

FINDINGS:
Of 23 470 studies identified for the prevalence of alcohol use, 328 studies were retained for systematic review and meta-analysis; the search strategy for the prevalence of FAS yielded 11 110 studies, of which 62 were used in our analysis. The global prevalence of alcohol use during pregnancy was estimated to be 9·8% (95% CI 8·9-11·1) and the estimated prevalence of FAS in the general population was 14·6 per 10 000 people (95% CI 9·4-23·3). We also estimated that one in every 67 women who consumed alcohol during pregnancy would deliver a child with FAS, which translates to about 119 000 children born with FAS in the world every year.

INTERPRETATION:
Alcohol use during pregnancy is common in many countries and as such, FAS is a relatively prevalent alcohol-related birth defect. More effective prevention strategies targeting alcohol use during pregnancy and surveillance of FAS are urgently needed.

FUNDING:
Centre for Addiction and Mental Health (no external funding was sought).

8. VISCERA

IBS and bone mineral density

J Clin Gastroenterol. 2018 Apr 18. doi: 10.1097/MCG.0000000000001031.

Risk of Fractures in Inflammatory Bowel Diseases: A Systematic Review and Meta-Analysis.

Komaki Y[1,2], Komaki F[1,3], Micic D[1], Ido A[3], Sakuraba A[1].

BACKGROUND:
Studies assessing the risk of fractures in inflammatory bowel diseases (IBD) have shown controversial results.

GOALS:
We performed a systematic review and meta-analysis to assess the risk of fractures in IBD.

STUDY:
Electronic databases were searched for cohort studies assessing the risk of fractures in IBD. The outcomes were the risk of overall fractures and at specific sites, and the association between the risk of fractures and the proportion of patients with corticosteroid use or osteoporosis.

RESULTS:
Ten studies including 470,541 patients were identified. The risk of overall fractures in IBD patients was similar to controls [odds ratio (OR), 1.08; P=0.70; 95% confidence interval (CI), 0.72-1.62) with moderate heterogeneity (I=74.4%) which appeared to be due to the variable power and outcomes among the studies. The OR of fractures at the spine was significantly elevated at 2.21 (P<0.0001; 95% CI, 1.39-3.50) with low heterogeneity (I=26.1%). Meta-regression showed a correlation with the proportion of patients with steroid use. Risks of fractures at other sites (hip, rib, and wrist) were not elevated. Patients with fractures were more commonly on steroids compared with those without fractures (OR, 1.47; P=0.057; 95% CI, 0.99-2.20; I<0.0001%), but there was no correlation with osteoporosis.

CONCLUSIONS:
IBD patients had no increased risk of overall fractures, but were at significantly increased risk of fractures at the spine, which was associated with steroid use. Strict surveillance and prevention of spine fractures are indicated in patients with IBD.

13 A. CRANIUM

Trigeminal neuralgia

Clin J Pain. 2018 Jul;34(7):600-609. doi: 10.1097/AJP.0000000000000578.

Altered Spontaneous Brain Activity in Patients With Idiopathic Trigeminal Neuralgia: A Resting-state Functional MRI Study.

Yuan J[1,2], Cao S[2], Huang Y[1], Zhang Y[2], Xie P[3], Zhang Y[3], Fu B[3], Zhang T[4], Song G[4], Yu T[3], Zhang M[1].

OBJECTIVES:
To identify the changes of local coherence and intrinsic brain activity in resting-state idiopathic trigeminal neuralgia (ITN) patients by using regional homogeneity (ReHo) and fractional aptitude of low-frequency fluctuation (fALFF) analysis.

METHODS:
ReHo and fALFF were analyzed in 23 ITN patients and 23 age-matched and sex-matched pain-free controls to detect the functional abnormality in the brains of ITN patients. Correlations between ReHo and fALFF were analyses. ITN pain intensity were also assessed in the ITN group.

RESULTS:
Compared with pain-free controls, ITN patients exhibited significantly abnormal ReHo and fALFF in several brain regions, including the cerebellum, cingulate cortex, temporal lobe, putamen, occipital lobe, limbic lobe, precuneus, insula, medial, and superior frontal gyrus compared with healthy controls. Correlation analysis showed that ReHo values of several altered brain areas positively correlated with visual analog scale values. But no correlation was found between fALFF and visual analog scale.

DISCUSSION:
Our results showed that ITN patients exhibited significantly abnormal spontaneous brain activity in several brain regions that are involved in pain modulation and perception. The present study reflects the maladaptive process of daily pain attacks and may enhance the understanding of how chronic pain affects local intrinsic brain activity.

13 B. TMJ/ORAL

Myocardial infarct and periodontitis

1:22034518765735. doi: 10.1177/0022034518765735.

Severe Periodontitis Is Associated

J Dent Res. 2018 Mar with Myocardial Infarction in Females.

Nordendahl E[1], Gustafsson A[1], Norhammar A[2,3], Näsman P[4], Rydén L[2], Kjellström B[2]; PAROKRANK Steering Committee.

The aim of the present study was to test the hypothesis that there is a sex difference in the association between periodontitis (PD) and a first myocardial infarction (MI). The analysis in the case-control study was based on 785 patients (147 females and 638 males) with a first MI and 792 matched controls (147 females and 645 males), screened for cardiovascular risk factors and subjected to a panoramic dental X-ray. Periodontal status was defined by alveolar bone loss and diagnosed as no PD (≥80% remaining alveolar bone), mild to moderate PD (66% to 79%), or severe PD (<66%). Logistic regression was used when analyzing PD as a risk factor for MI, adjusting for age, smoking, diabetes, education, and marital status. The mean age was 64 ± 7 y for females and 62 ± 8 y for males. Severe PD was more common in female patients than female controls (14 vs. 4%, P = 0.005), with an increased risk for severe PD among female patients with a first MI (odds ratio [OR] = 3.92, 95% confidence interval [CI] =1.53 to 10.00, P = 0.005), which remained (OR = 3.72, 95% CI = 1.24 to 11.16, P = 0.005) after adjustments. Male patients had more severe PD (7% vs. 4%; P = 0.005) than male controls and an increased risk for severe PD (OR = 1.88, 95% CI = 1.14 to 3.11, P = 0.005), but this association did not remain following adjustment (OR = 1.67, 95% CI = 0.97 to 2.84, NS).

Severe PD was associated with MI in both females and males. After adjustments for relevant confounders, this association did, however, remain only in females. These data underline the importance of considering poor dental health when evaluating cardiovascular risk, especially in females.

13 C. AIRWAYS/SWALLOWING/SPEECH

Female veterans

J Clin Sleep Med. 2018 May 29. pii: jc-17-00399.

Insomnia Symptoms Among Female Veterans: Prevalence, Risk Factors, and the Impact on Psychosocial Functioning and Health Care Utilization.

Babson KA, Wong AC, Morabito D, Kimerling R.

Abstract

STUDY OBJECTIVES:

To examine the prevalence of self-reported insomnia symptoms, identify subgroups of female veterans with clinically significant insomnia symptoms, and examine the effect on psychosocial functioning and health care utilization.

METHODS:

Cross-sectional analysis of insomnia symptoms and associated characteristics among a stratified random sample of female veterans using Department of Veterans Affairs primary care facilities between October 1, 2010 and September 30, 2011 (n = 6,261) throughout the United States. The primary outcome was reported presence of insomnia symptoms. Other variables included psychological disorders, chronic conditions, chronic pain, and demographic variables.

RESULTS:

Overall, 47.39% of female veterans screened positively for insomnia symptoms. They differed demographically from those without insomnia symptoms and reported more substance use, chronic physical conditions, and psychological conditions. Receiver operating characteristic analysis indicated the primary factor that differentiated those with versus those without insomnia symptoms was depression. Individuals were further differentiated based on presence of pain and posttraumatic stress disorder. Results yielded eight homogenous subgroups of women at low and high risk of experiencing insomnia symptoms.

CONCLUSIONS:

Sleep problems are common among female veterans (47.39%) despite limited diagnosis of sleep disorders (0.90%). Eight unique subgroups of female veterans with both low and high insomnia symptoms were observed. These subgroups differed in terms of psychosocial functioning and health care utilization, with those with depression, posttraumatic stress disorder, and pain having the poorest outcomes. These results shed light on the prevalence of insomnia symptoms experienced among female veterans and the effect on psychosocial functioning and health care utilization. Results can inform targeted detection and customized treatment among female veterans.

Sleep apnea and lateral sleep position

J Clin Sleep Med. 2018 Jun 15;14(6):985-990. doi: 10.5664/jcsm.7166.

High Negative Predictive Value of Normal Body Mass Index for Obstructive Sleep Apnea in the Lateral Sleeping Position.

Mokros Ł[1], Kuczynski W[2], Gabryelska A[2], Franczak Ł[2], Spałka J[2], Białasiewicz P[2].

STUDY OBJECTIVES:
Obesity is a major risk factor for obstructive sleep apnea (OSA). Patients who are not obese and who have OSA usually present with a low apnea-hypopnea index (AHI) in the lateral sleeping position. Hence, sleep-disordered breathing (SDB) seems more dependent on body mass index (BMI) in the lateral sleeping position than the supine sleep position. This makes obesity a better predictor of SDB in the lateral sleeping position. The objective of this study was to find a negative predictive value of normal BMI for SDB in relation to sleep positions, thus defining a group of patients who could be treated by positional intervention, and prioritizing the use of polysomnography diagnostics.

METHODS:
This study comprises a retrospective and prospective part run on groups of 1,181 and 821 consecutive patients, respectively. All had been referred to the university-based sleep laboratory because of suspected OSA and underwent polysomnography.

RESULTS:
In the retrospective study, areas under the receiver operating characteristic curves for normal BMI at AHI ≥ 5 and AHI ≥ 15 events/h were found to be larger in the lateral sleeping positing than supine: 0.79 versus 0.69 and 0.80 versus 0.68, respectively ($P < .05$). Comparable results were obtained in the prospective study. For normal BMI, the negative predictive value for AHI < 15 events/h in the lateral sleep position was 97.5% and 97.1% in the retrospective and prospective study, respectively.

CONCLUSIONS:
Normal BMI offers a high negative predictive value for moderate or severe OSA in the lateral sleeping position.

Chronic pain and sleep problems

Sleep Medicine

Sleep disturbances and sleep disorders in adults living with chronic pain: A meta-analysis

- J.L. Mathias[a,], M.L. Cant[a], A.L.J. Burke[a, b]

https://doi.org/10.1016/j.sleep.2018.05.023

Highlights

• Sleep initiation and maintenance are most affected in those with CP.
• Clinically diagnosed sleep disorders are very prevalent in persons with CP.
•Sleep problems should always be assessed and then treated in conjunction with CP.

Abstract

Objectives

Chronic pain, with or without an identified diagnosis or cause, is widespread and commonly associated with sleep disturbances. However, research has often used poor quality measures of sleep and focused on specific pain conditions, thereby limiting its reliability and applicability to the wider CP population. This study meta-analysed the findings from studies that used objective polysomnographic measures of sleep or examined diagnosed sleep disorders in people with CP.

Methods

Three databases were searched (PubMed, PsychINFO, Embase; inception to June 2017) for case-controlled polysomnography studies and studies that reported the prevalence of diagnosed sleep disorders in adults with CP. Hedge's *g* effect sizes and prevalence rates were calculated using the data from 37 studies.

Results

Polysomnographic measures of sleep onset latency and efficiency, time awake after sleep onset and awakenings were all significantly worse in those with CP when compared to healthy controls (large effects). Total sleep time, light sleep duration (NREM 1), number of stage-shifts, respiratory-related events and periodic limb-movements were also worse for those with CP, albeit to a lesser extent (small to medium effects). The pooled prevalence of sleep disorders in CP was 44%, with insomnia (72%), restless legs syndrome (32%) and obstructive sleep apnea (32%) being the most common diagnoses.

Conclusions

Objective polysomnographic measures indicate that individuals with CP experience significant sleep disturbances, particularly with respect to sleep initiation and maintenance. Clinically diagnosed sleep disorders are also very prevalent. It is imperative that sleep disturbances and disorders be assessed and treated in conjunction with the CP.

14. HEADACHES

Migraine and psychiatric disorders

Headache. 2018 Jun;58(6):859-872. doi: 10.1111/head.13325.

Acceptance, Psychiatric Symptoms, and Migraine Disability: An Observational Study in a Headache Center.

Seng EK[1,2], Kuka AJ[3], Mayson SJ[4], Smitherman TA[3], Buse DC[2].

OBJECTIVE:
To evaluate relationships between psychiatric symptoms, acceptance, and migraine-related disability in a sample of people with migraine presenting at a tertiary care headache center.

BACKGROUND:
Migraine is a chronic disease that can be severely disabling. Despite a strong theoretical basis and evidence in other pain conditions, little is known about relationships between acceptance, psychiatric symptoms, and migraine-related disability.

METHODS:
Ninety patients with physician-diagnosed migraine completed surveys assessing demographics, headache symptoms, severe migraine-related disability (Migraine Disability Assessment Scale total score dichotomized at ≥ 21), depression (Patient Health Questionnaire-9) and anxiety symptoms (Generalized Anxiety Disorder-7), and acceptance (Chronic Pain Acceptance Questionnaire; subscales: Pain Willingness and Activity Engagement).

RESULTS:
Participants (77.8% white, non-Hispanic; 85.6% women; and 50.0% with a graduate level education) reported an average headache pain intensity of 6.7/10 (SD = 2.0). One-third (36.0%) reported chronic migraine, and half (51.5%) reported severe migraine-related disability. Lower acceptance was associated with severe migraine-related disability, $t(54) = 4.13$, $P < .001$. Higher activity engagement was associated with lower average headache pain intensity ($r = -.30$, $P = .011$). Higher acceptance was associated with lower levels of depression ($r = -.48$, $P < .001$) and anxiety symptoms ($r = -.37$, $P = .003$). Pain willingness and activity engagement serially mediated relationships between depression symptoms and severe migraine-related disability (indirect effect = 0.05, 95% CI = 0.01, 0.15), and between anxiety symptoms and severe migraine-related disability (indirect effect = 0.12, 95% CI = 0.02, 0.31).

CONCLUSION:
Results provided preliminary support for a theoretical pathway by which psychiatric symptoms may influence migraine-related disability, in part, through their relationships with pain willingness and activity engagement.

Quality of life

Headache. 2018 Jun 7. doi: 10.1111/head.13330.

Patients With Migraine Have Substantial Reductions in Measures of Visual Quality of Life.

Hanson LL[1], Ahmed Z[2], Katz BJ[1,2], Warner JEA[1,2], Crum AV[1,2], Zhang Y[3,4], Zhang Y[3,5], Baggaley S[2], Pippett K[2,4], Cortez MM[2], Digre KB[1,2].

OBJECTIVE:
Migraine is associated with several important visual symptoms, during both acute attacks and headache-free intervals. The purpose of this investigation was to use validated vision-related quality of life instruments to assess the effect of migraine on visual quality of life.

BACKGROUND: Many migraineurs experience visual aura, increased photophobia during and between headache attacks, and increased symptoms of dry eye with structural changes in corneal nerve endings. Other visual symptoms associated with migraine include positive persistent visual phenomenon (visual snow) and transient vision changes. Previous research looking at the disability associated with migraine has shown that patient-reported quality of life data can be useful in determining the severity of disease burden. Recent published literature has suggested that visual symptoms related to migraine represent a proportionally minor burden to patients, compared to other manifestations of migraine, but no previous studies have assessed how migraine affects visual quality of life.
METHODS: In this cross-sectional quantitative survey, visual quality of life in individuals with chronic and episodic migraine was assessed using the National Eye Institute Visual Function Questionnaire-25, and the 10-item National Eye Institute Visual Function Questionnaire-25 Neuro-Ophthalmic Supplement. Overall headache severity and impact was assessed using the Migraine-specific Quality of Life Questionnaire (Version 2.1) and the Headache Impact Test-6. Participants were recruited from Headache and Neuro-ophthalmology subspecialty clinics. The target sample size was 30 participants per subgroup. The results were compared to those from disease-free controls and to results from other neuro-ophthalmic disease quality of life studies.
RESULTS:
Among 29 participants with chronic migraine, vision-specific quality of life scores were all statistically significantly decreased compared to disease-free controls. The National Eye Institute Visual Function Questionnaire-25 median composite score was 85 for chronic migraineurs and 96 for controls ($P < .001$). The 10-item National Eye Institute Visual Function Questionnaire-25 Neuro-Ophthalmic Supplement median score was 72 for chronic migraineurs and 95 for controls ($P < .001$). Among 37 participants with episodic migraine, vision-specific quality of life scores were also decreased compared to disease-free controls. In the episodic migraine group, decreases in the National Eye Institute Visual Function Questionnaire-25 scores were not statistically significant (median score 91, $P = .01$ compared to the control group), but decreases in the 10-item National Eye Institute Visual Function Questionnaire-25 Neuro-Ophthalmic Supplement remained statistically significant (median score 85, $P = .003$ compared to the control group). Chronic migraineurs had decreased visual quality of life scores compared to those with episodic migraines. Participants with chronic migraine had visual quality of life scores that were as poor as those previously published for patients with other neuro-ophthalmic disorders such as multiple sclerosis, myasthenia gravis, and ischemic optic neuropathy.

CONCLUSIONS:
Visual quality of life is significantly adversely affected in migraine sufferers. In fact, patients with chronic migraine may have visual quality of life impacts that are as significant as those associated with other common neuro-ophthalmic disorders. Future studies of the overall disease burden in patients with migraine should include an evaluation of the effects on visual functioning.

24. ELBOW

KT of elbow helps

BMC Musculoskelet Disord. 2018 Jun 19;19(1):193. doi: 10.1186/s12891-018-2118-3.

Kinesio taping reduces elbow pain during resisted wrist extension in patients with chronic lateral epicondylitis: a randomized, double-blinded, cross-over study.

Cho YT[1], Hsu WY[1], Lin LF[2], Lin YN[3,4].

BACKGROUND:
Lateral epicondylitis is frequently seen in racquet sport players and the treatments are usually symptomatic rather than curative. Taping therapy is cheap and easy to apply in the sport field. In this study we valued the effectiveness of Kinesio taping (KT) on immediate pain control for patients with chronic lateral epicondylitis.

METHODS:
We conducted a randomized, double-blinded, cross-over study with 15 patients with chronic lateral epicondylitis. All participants received two taping sessions in a random order with a 3-day interval in between: one with KT and the other with sham taping (ST). Pain perceived during resisted wrist extension and at rest using numeric rating scale (NRS), the pain-free grip strength, and the pressure pain threshold, were measured before and 15 min after the tape was applied.

RESULTS:
A significant reduction of 2.1 ± 1.6 (Z = - 3.081, P = 0.002) and 0.7 ± 0.8 (Z = - 2.428, P = 0.015) was found on a NRS with KT and ST, respectively, indicating that both taping sessions produced immediate pain relief for resisted wrist extension. Both taping sessions significantly improved the pain-free grip strength with increases of 3.31 ± 5.05 (Z = - 2.615, P = 0.009) and 2.43 ± 3.31 (Z = - 2.783, P = 0.005) kg found with KT and ST, respectively. Compared with ST, KT exhibited superiority in controlling pain experienced during resisted wrist extension (Z = - 2.168, P = 0.030).

CONCLUSIONS:
Taping produced unneglectable placebo effects on pain relief and painf-free grip strength for patients with lateral epicondylitis, and KT seemed to have additional effects on controlling pain that was elicited by resisted wrist extension.

31. KNEE

Soft knee brace

THE IMMEDIATE EFFECT OF A SOFT KNEE BRACE ON DYNAMIC KNEE INSTABILITY IN PERSONS WITH KNEE OSTEOARTHRITIS

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Background: Wearing a soft knee brace has been shown to reduce self-reported knee instability in persons with knee osteoarthritis (OA).1 There is a need to assess whether a soft knee brace has a beneficial effect on objectively assessed dynamic knee instability as well. Objectives: The aims of the study were: (i) to evaluate the immediate effect of a soft knee brace on dynamic knee instability, and (ii) to assess the difference in effect between a tight and a non-tight knee brace in persons with knee OA.

Methods: A within-subject cross-over design was used, comparing wearing a soft knee brace with not wearing a soft knee brace, and comparing wearing a tight brace (standard fit) with wearing a non-tight brace (one size larger). The order of brace type was randomised. Participants walked, both without and with the brace, on a treadmill, which is integrated in the GRAIL system, placed in a virtual reality environment (GRAIL system, MOTEKForce Link, The Netherlands). Participants were subjected to two tasks: (i) level walking and (ii) walking with mechanical perturbations on the treadmill. Mechanical perturbations on the treadmill comprised five lateral and five medial translations (2 cm displacements) of the treadmill belts occurring during 20%–50% of the gait cycle. During the walking trials, 3D movement of the lower legs, pelvis and trunk were captured via markers on anatomical landmarks at 100 Hz using a motion-capture system (Vicon, Oxford, United Kingdom). The outcome measure was dynamic knee instability, expressed by the Perturbation Response (PR), i.e. a biomechanics based measure reflecting deviation in the mean knee varus-valgus angle after a controlled mechanical perturbation, standardised to the mean (standard deviation) varus-valgus angle during level walking. Lower PR values indicate less deviation in the mean varus/valgus angle. Linear mixed-effect model analysis was used to evaluate the effect of a brace on dynamic knee instability.

Results: Thirty-eight persons with knee OA and self-reported knee instability from the Amsterdam Osteoarthritis Cohort participated in the study. Wearing a brace significantly reduced the PR compared to not wearing a brace (p0.05).

Conclusions: This study is the first to report that wearing a soft brace results in an improvement of objectively assessed dynamic knee instability, beyond the previously reported subjective improvement.

32 A. KNEE/ACL

Changes in sensorimotor system

Knee Surgery, Sports Traumatology, Arthroscopy pp 1–10|

Changes in the sensorimotor system and semitendinosus muscle morphometry after arthroscopic anterior cruciate ligament reconstruction: a prospective cohort study with 1-year follow-up

- Marialuisa Gandolfi Matteo Ricci lena Sambugaro Nicola Valè leonora Dimitrova Andrea Meschieri ilvano Grazioli Alessandro Picelli Calogero Foti Francesco RulliPurpose

To evaluate the time course of sensorimotor integration processes involved in balance capability during 1-year follow-up after arthroscopic anterior cruciate ligament (ACL) reconstruction. To evaluate whether an association exists between balance performance and semitendinosus muscle morphometry features.

Methods

Twenty-seven patients (mean age 29.6 ± 10.8 years) were prospectively followed with stabilometry and ultrasound at 3 months (T0), 6 months (T1), and 1 year (T2) after arthroscopic ACL reconstruction. Body sway and sensorimotor integration processes were evaluated by calculating the percentage difference of sway (PDS) on two surface conditions.

Results

A significant difference in PDS was observed over time ($p < 0.001$). The interaction "Time × Condition" showed significant differences ($p = 0.02$), with worse performance on the compliant than the firm surface. There was a significant difference in CSA ($p < 0.001$), MT ($p < 0.001$), and %HRD ($p < 0.001$) over time. The interaction "Time*side" was significant for CSA ($p = 0.02$) and %HRD ($p = 0.01$). A negative correlation between PDS on compliant surface and CSA was measured at 3- ($r = -0.71$, $n = 27$, $p < 0.001$) and 6-month post-surgery ($r = -0.47$, $n = 27$, $p = 0.013$).

Conclusions

Balance was regained within the first 6 months after surgery, while morphometry of the semitendinosus muscle improved mostly between 6 and 12 months in patients who returned to sports activities. Balance capabilities paralleled semitendinosus muscle morphometry improvements. The instrumental assessment of sensorimotor integration processes is relevant in clinical practice as screening tests for primary and secondary prevention of ACL injury.

Level of evidence Prospective studies, Level II.

34. PATELLA

Hip and foot involvement

Association of Hip and Foot Factors With Patellar Tendinopathy (Jumper's Knee) in Athletes

Authors: Luciana D. Mendonça, PT, PhD[1], Juliana M. Ocarino, PT, PhD[2], Natália F.N. Bittencourt, PT, PhD[3],Luciana G. Macedo, PT, PhD[4], Sérgio T. Fonseca, PT, ScD[2]
Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–29 **DOI:**10.2519/jospt.2018.7426

Study Design
Clinical measurement, cross-sectional.

Background
Investigations on the causes of patellar tendinopathy (PT) should consider impairments at the hip and foot/ankle since they are known to influence movement patterns and affect patellar tendon loading.

Objectives
To investigate, by means of CART analysis, impairments of the hip and foot/ankle that are associated with PT in volleyball and basketball athletes.

Methods
One-hundred and ninety athletes were assessed for impairments of the hip and foot/ankle including: shank-forefoot alignment (SFA), ankle dorsiflexion range of motion (DF ROM), iliotibial band flexibility, passive hip internal rotation (IR) ROM, and hip external rotator (ER) and hip abductor isometric strength. Athletes with tenderness and/or pain at the inferior pole of the patella were considered as having PT. Athletes with VISA-P scores above 95 points, no pain at single-leg decline squat and no history of patellar tendon pain history were considered as not having PT. CART analysis was performed to identify interacting factors associated with PT.

Results
Interactions among passive hip IR ROM, SFA, hip ER and abductor strength identified athletes with and without PT. The model achieved 71.2% sensitivity and 74.4% specificity. The area under the ROC curve was 0.77 (95% confidence interval: 0.70 - 0.84; $p<0.0001$).

Conclusion
Impairments of the hip and foot/ankle are associated with the presence of PT in volleyball and basketball athletes. Future studies should evaluate the role of these impairments in the etiology of PT. *J Orthop Sports Phys Ther, Epub 23 May 2018. doi:10.2519/jospt.2018.7426*

35. KNEE/TOTAL

Hormone replacement increases rick of

Arthritis Rheumatol. 2018 Mar 7. doi: 10.1002/art.40483.

Female Reproductive and Hormonal Factors and Incidence of Primary Total Knee Arthroplasty Due to Osteoarthritis.

Hussain SM[1], Wang Y[1], Giles GG[2], Graves S[3], Wluka AE[1], Cicuttini FM[1].

OBJECTIVE:
To examine the associations of female reproductive and hormonal factors with incidence of total knee arthroplasty (TKA) for osteoarthritis (OA), and to determine whether the associations differ according to overweight/obesity status.

METHODS:
This study included 22,289 women in the Melbourne Collaborative Cohort Study. Data on age at menarche, pregnancy, parity, years of menstruation, oral contraceptive (OC) use, menopausal status, and hormone replacement therapy (HRT) were collected in 1990-1994. Incidence of TKA during 2001-2013 was determined by linking cohort records to the Australian Orthopaedic Association National Joint Replacement Registry. All analyses were adjusted for age, body mass index (BMI) at midlife, change in BMI (from early reproductive age to midlife), country of birth, physical activity, smoking, and education level.

RESULTS:
Over the course of 12.7 years, 1,208 TKAs for OA were identified. Ever being pregnant was associated with increased risk of TKA (hazard ratio [HR] 1.32 [95% confidence interval (95% CI) 1.06-1.63]). Parity was positively associated with risk of TKA (P for trend = 0.003). OC users had increased risk of TKA compared with non-users (for OC use of <5 years, HR 1.25 [95% CI 1.08-1.45]; for OC use of ≥5 years, HR 1.17 [95% CI 1.00-1.37]). A 1-year increase in menstruation was associated with a 1% decrease in risk of TKA (HR 0.99 [95% CI 0.97-0.99]). These associations remained significant only in women of normal weight at early reproductive age. Current HRT users had increased risk of TKA compared with non-users (HR 1.37 [95% CI 1.14-1.64]); the association was significant only in non-obese women at midlife.

CONCLUSION:
Reproductive and hormonal factors were associated with risk of knee OA. These associations remained significant in women of normal weight at early reproductive age and in non-obese women at midlife. Further work is needed to understand the complex effect of these factors on knee OA.

37. OSTEOARTHRITIS/KNEE

PRP and HA

Is local platelet-rich plasma injection clinically superior to hyaluronic acid for treatment of knee osteoarthritis? A systematic review of randomized controlled trials

- Di Yalong [†], Han Changxu [†], Zhao Liang and Ren Yizhong

*Arthritis Research & Therapy*2018**20**:128
https://doi.org/10.1186/s13075-018-1621-0

Background

In this study, we evaluated whether platelet-rich plasma (PRP) is superior to hyaluronic acid (HA) in the treatment of knee osteoarthritis.

Methods

The Cochrane Central Register of Controlled Trials, PubMed, and Embase databases were searched for English-language, human in vivo studies on the treatment of symptomatic knee osteoarthritis with intra-articular PRP compared with HA. The following keywords were used for the search: “platelet-rich plasma,” “PRP,” “platelet-rich fibrin,” “PRF,” “platelet,” “plasma,” “arthritis,” “osteoarthritis,” “gonarthrosis,” and “degeneration.”

Results

Seven articles reporting 908 patients and 908 knees were analyzed, including 44% men and 56% women with a mean age of 59.8 years. All studies met the minimal clinically important difference criteria and showed statistically significant improvements in clinical outcomes, including pain, physical function, and stiffness, with PRP treatment. All except two studies showed significant differences between PRP and HA regarding clinical outcomes of pain and function.

Conclusions

PRP intra-articular injection of the knee may be an effective alternative treatment for knee OA, especially in patients with mild knee OA. Although some studies suggested that the effect of PRP was no better than HA, we found that it was no worse. A large, multicenter, randomized trial is needed to further assess the efficacy of PRP treatment for patients with knee OA.

OA and post-operative pain

Preoperative neuropathic pain like symptoms and central pain mechanisms in knee osteoarthritis predicts poor outcome 6 months after total knee replacement surgery
The Journal of Pain — Kurien T, et al. | June 19, 2018

Assuming the significance of preoperative pain characteristics in osteoarthritis (OA) patients in explaining persistent pain after total knee replacement (TKR), researchers evaluated the degree of neuropathic pain symptoms and pain sensitisation via pain phenotyping OA patients into two groups based on the Pain

DETECT questionnaire: High PainDETECT group (scores ≥19) indicating neuropathic pain-like symptoms, Low PainDETECT group (scores <19) indicating nociceptive or mixed pain. As per findings, postoperative pain could be independently predicted with preoperative PainDETECT scores. They noted a higher risk of developing chronic postoperative pain after TKR surgery among knee OA patients with neuropathic pain like symptoms identified using the PainDETECT questionnaire.

45 A. MANUAL THERAPY LUMBAR & GENERAL

MDT reliability

Reliability of Mechanical Diagnosis and Therapy System in Patients With Spinal Pain: A Systematic Review

Authors: Alessandra Narciso Garcia, PT[1], Lucíola da Cunha Menezes Costa, PhD[1], Fabrício Soares de Souza, FT, MSc[1], Matheus Oliveira de Almeida, FT, PhD[1], Amanda Costa Araujo, FT[1], Mark Hancock, PhD[2], Leonardo Oliveira Pena Costa, PhD[1,3]
Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–39 **DOI:**10.2519/jospt.2018.7876

Study Design
Systematic review.

Background
An updated summary of the evidence for the reliability of Mechanical Diagnosis and Therapy (MDT) System in patients with spinal pain is needed.

Objective
To investigate the evidence on the intra and inter-rater reliability of MDT system in patients with spinal pain.

Methods
Search strategies on MEDLINE, CINAHL, EMBASE, PEDro and Scopus were conducted. We included any study design as long as reliability of the MDT method was tested in patients with spinal pain. We collected data on the reliability of MDT to identify: main and sub-syndromes, directional preference, centralization phenomenon and lateral shift. The methodological quality of studies was assessed using the Quality appraisal tool for studies of diagnostic reliability and The Guidelines for Reporting Reliability and Agreement Studies checklists.

Results
Twelve studies were included (eight studies on back pain, pooled n=2160 patients; three studies on neck pain, pooled n=45 patients; and three studies recruited mixed spinal conditions, pooled n=389 patients). Studies investigating back pain patients reported kappa estimates ranging from 0.26-1.0 (main and sub-syndromes); 0.27-0.90 (directional preference) and 0.11-0.70 (centralization phenomenon). Kappa estimates for studies investigating neck pain ranged from 0.47 to 0.84 (main and sub-syndromes) and 0.46 (directional preference). In mixed populations kappa estimates ranged from 0.56-0.96 (main and sub-syndromes).

Conclusion
The MDT system appears to have acceptable inter-rater reliability for classifying patients with back pain into main/sub-syndromes, when applied by therapists who have completed the credentialing examination, but unacceptable reliability in other therapists. We found conflicting evidence regarding the reliability of MDT system in patients with neck pain or mixed pain locations. *J Orthop Sports Phys Ther, Epub 22 Jun 2018. doi:10.2519/jospt.2018.7876*

45 B. MANUAL THERAPY CERVICAL

NDI good

An Overview of Systematic Reviews on Patient-Reported Outcome Measures Used on Neck Disorders

Authors: Pavlos Bobos, PT[1], Joy C. MacDermid, PT, PhD[2], David M. Walton, PT, PhD[3], Anita Gross, PT, MSc[4],P. Lina Santaguida, PT, PhD[5]
Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–76 **DOI:**10.2519/jospt.2018.8131
Study Design Overview of systematic reviews.
Background
The evaluation of psychometric properties of neck Patient-Reported Outcome Measures (PROMs) from multiple systematic reviews (SRs) will provide a broader view and may identify potential conflicting or consistent results for their psychometric properties.

Objective The purpose of this study was to conduct an overview of SRs and synthesize evidence to establish the current state of knowledge on psychometric properties of PROM's for patients with neck disorders.
Methods
An electronic search of 6 databases (MEDLINE, EMBASE, CINAHL, ILC, CENTRAL and LILACS) was conducted to identify reviews that addressed at least one measurement property of outcome measures for people with neck pain. Only SRs with PROMs were included in the analysis. Risk of bias was assessed with AMSTAR tool. Data on measurement properties were extracted from each SR.

Results
From 13 SRs, eight PROMs were evaluated in more than 2 reviews. Risk of bias scores ranged from moderate (score 5-8) to high (score <4). Findings on internal consistency, test re-test reliability, construct validity, responsiveness to change, content and structural validity were synthesized for: Neck Disability Index (NDI) in 11 SRs, Northwick Park Neck Pain Questionnaire (NPQ) in 6 SRs, Copenhagen Neck Functional Disability Scale (CNDFS) and Neck Pain and Disability Scale (NPDS) in 6 SRs, Core Neck Questionnaire (CNQ) and Patient Specific Functional Scale (PSFS) in 3 SRs, Whiplash Disability Questionnaire (WDQ) and Neck Bournemouth Questionnaire (NBQ) in 3 SRs.

Conclusions
High quality evidence was found for NDI of good to excellent internal consistency and moderate to excellent test-retest reliability. Moderate quality evidence was found for NPQ of good to excellent internal consistency and good test-retest reliability. High quality evidence was found for CNFDS of excellent test-retest reliability and good to strong construct validity with pain scales. Moderate quality evidence was found for NDPS of unclear to excellent internal consistency and moderate to strong concurrent associations between NDPS and NDI, NDPS and Global assessment of change. Moderate quality evidence was found for WDQ of excellent internal consistency and high test-retest reliability for PSFS. *J Orthop Sports Phys Ther, Epub 22 Jun 2018. doi:10.2519/jospt.2018.8131*

Keyword: neck pain, overview, psychometric, questionnaires

50 A. MOTOR CONTROL

Phenotypes in LBP

Motor Control Changes in Low-Back Pain: Divergence in Presentations and Mechanisms

Authors: Jaap H. van Dieën, PhD[1], N. Peter Reeves, PhD[2], Greg Kawchuk, PhD[3], Linda van Dillen, PT, PhD[4],Paul W. Hodges, PT, PhD[5]
Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–24 **DOI:**10.2519/jospt.2019.7917

Synopsis

Patients with low-back pain have been shown to display differences compared to healthy individuals in all aspects of trunk motor control, most often studied as differences in muscle activity and kinematics.

However, differences in these aspects of motor control are largely inconsistent. We propose that this may reflect existence of two phenotypes, possibly the two ends of a distribution, one with "tight" control over trunk movement and one with "loose" control. Both may have beneficial effects, with tight control protecting against large tissue strains from uncontrolled movement and loose control protecting against high muscle forces and resulting spinal compression. Both may also have long-term negative consequences. Whereas tight control may cause for example high compressive loading on the spine and sustained muscle activity, loose control may cause excessive tensile strains of tissues. Moreover, both phenotypes could be the result of either an adaptation process aimed at protecting the low back, or from direct interference of low-back pain and related changes with trunk motor control.

The existence of such phenotypes would suggest different motor control exercise interventions. Although some promising data supporting these phenotypes have been reported, it remains to be shown whether these phenotypes are valid, how treatment can be targeted to these phenotypes and whether this targeting yields superior clinical outcomes. *J Orthop Sports Phys Ther, Epub 12 Jun 2018. doi:10.2519/jospt.2019.7917*

In LBP – Hodges

Analysis of Motor Control in Low-Back Pain Patients: A Key to Personalized Care?

Authors: Jaap H. van Dieën, PhD[1], N. Peter Reeves, PhD[2,3], Greg Kawchuk, PhD[4], Linda van Dillen, PT, PhD[5],Paul W. Hodges, PT, PhD[6]
Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–24 **DOI:**10.2519/jospt.2019.7916

Synopsis

Motor control exercise has been shown to be effective in the management of low-back pain (LBP), but effect sizes are modest, possibly due to the fact that studies have used a one-size-fits-all approach, whereas literature suggests that patients may differ in presence or type of motor control issues. In this commentary, we address the question whether consideration of such variation in motor control issues might contribute to more personalized motor control exercise for patients with LBP.

Such an approach is plausible, since motor control changes may play a role in persistence of pain through effects on tissue loading that may cause nociceptive afference in particular in case of peripheral sensitization.

Subgrouping systems used in clinical practice which comprise motor control aspects allow reliable classification that is in part aligned with findings in studies on motor control in patients with LBP. Motor control issues may have heuristic value for treatment allocation, as the different presentations observed suggest different targets for motor control exercise, but this remains to be proven.

Finally, clinical assessment of patients with LBP should take into account more aspects than motor control alone, including pain mechanisms, musculoskeletal health and psychosocial factors, and may need to be embedded in a stratification approach based on prognosis to avoid undue diagnostic procedures. *J Orthop Sports Phys Ther, Epub 12 Jun 2018. doi:10.2519/jospt.2019.7916*

Keyword: back pain, diagnostics, exercise, postural control, subgrouping

52. EXERCISE

Exercise in elderly

Associations of distinct levels of physical activity with mobility in independent healthy older women

Experimental Gerontology — Rava A, et al. | June 25, 2018

Whether body composition and mobility parameters differ among older women with various levels of engagement in physical activity was investigated in this study involving healthy older women aged from 65 to 91 years. Additionally, the links between mobility and distinct levels of physical activity also evaluated. Based on the weekly moderate-to-vigorous physical activity (MVPA) time in 10 min bouts, allocation of participants to following three groups was done: highest MVPA (H-MVPA), middle MVPA (M-MVPA) and lowest MVPA (L-MVPA); this was followed by evaluation of body composition (fat mass [FM] and fat free mass [FFM]) variables and static and dynamic balance, lower limbs strength and aerobic capacity via mobility tests. MVPA was found to be related to body composition and mobility parameters, while no association of light physical activity with any measured body composition nor mobility parameters was found. The benefits of MVPA in healthy older women could include maintaining body composition and mobility parameters to preserve independence in later life.

55. SCOLIOSIS

Brain changes

AJNR Am J Neuroradiol. 2018 Jun;39(6):1177-1184. doi: 10.3174/ajnr.A5634. Epub 2018 Apr 19.

Altered White Matter Microstructure in the Corpus Callosum and Its Cerebral Interhemispheric Tracts in Adolescent Idiopathic Scoliosis: Diffusion Tensor Imaging Analysis.

Xue C[1], Shi L[2], Hui SCN[1], Wang D[1], Lam TP[3], Ip CB[1], Ng BKW[3], Cheng JCY[3], Chu WCW[2].

BACKGROUND AND PURPOSE:
Neural system was one of the important contributors to the etiopathogenesis of adolescent idiopathic scoliosis; additionally, the morphology of corpus callosum interconnecting both hemispheres of the brain was found to be altered morphologically. Our aim was to evaluate and compare the microstructural changes of the corpus callosum and its interhemispheric white matter fiber tracts interconnecting both cerebral hemispheres in patients with adolescent idiopathic scoliosis and matched controls using diffusion tensor imaging.

MATERIALS AND METHODS:
Brain DTI was performed in 69 patients with adolescent idiopathic scoliosis (female, right thoracic/thoracolumbar curve) and 40 age-matched controls without adolescent idiopathic scoliosis (female). 2D and 3D segmentation of the corpus callosum were performed using a region-growing method, and the corpus callosum was further divided into 6 regions, including the rostrum, genu, anterior and posterior midbodies, isthmus, and splenium. The laterality index was calculated to quantify the asymmetry of the corpus callosum. Interhemispheric fiber tractography were performed using the Brodmann atlas.

RESULTS:
2D ROI analysis revealed reduced fractional anisotropy in the genu and splenium ($P = .075$ and $P = .024$, respectively). Consistently reduced fractional anisotropy on the left sides of the genu and splenium was also found in 3D ROI analysis ($P = .03$ and $P = .012$, respectively). The laterality index analysis revealed a pseudo-right lateralization of the corpus callosum in adolescent idiopathic scoliosis. Interhemispheric fibers via the splenium interconnecting Brodmann 3, 1, and 2; Brodmann 17; and Brodmann 18 (corresponding to the primary somatosensory cortex and primary and secondary visual cortices) were also found to have reduced fractional anisotropy ($P \leq .05$).

CONCLUSIONS:
Reduced fractional anisotropy was found in the genu and splenium of the corpus callosum and corresponding interhemispheric fiber tracts interconnecting the somatosensory and visual cortices via the splenium. Our results are suggestive of altered white matter microstructure within the brain of those with adolescent idiopathic scoliosis, which could be related to abnormal brain maturation during adolescence in adolescent idiopathic scoliosis and could possibly explain the previously documented somatosensory function impairment and visuo-oculomotor dysfunction in this condition.

56. ATHLETICS

Comparison

Arthroscopy: The Journal of Arthroscopic & Related Surgery

Shoulder Arthroscopy With Versus Without Suprascapular Nerve Release: Clinical Outcomes and Return to Sport Rate in Elite Overhead Athletes

- Georgios D. Tsikouris, M.D.[a,*], Ioanna K. Bolia, M.D., M.Sc., Ph.D.[a], Panagiota Vlaserou, B.S., M.Sc.[a], Nikolaos Odantzis, B.S.[a], Konstantinos Angelis, B.S., M.Sc.[a], Vasileios Psychogios, M.D., Ph.D.[b]

https://doi.org/10.1016/j.arthro.2018.03.046

Purpose To compare the clinical outcomes and return to sport rate between elite overhead athletes who underwent shoulder arthroscopy and decompression of the suprascapular nerve (SSN) versus overhead athletes who underwent shoulder arthroscopy without SSN release.

Methods From 2007 to 2014, high-level overhead athletes diagnosed with a rotator cuff tear and/or a glenoid labral lesion and SSN entrapment were included in the study if their symptoms did not improve with nonoperative treatment and if they agreed to undergo surgery and participate. Their preoperative University of California at Los Angeles (UCLA) shoulder score, bilateral postoperative Constant scores, postoperative UCLA score, and return to sport rate were evaluated and compared with those of a group of elite athletes who had a similar diagnosis but refused to undergo SSN decompression during shoulder arthroscopy.

Results Thirty-five athletes (25 male, 10 female) were included in the SSN decompression group (group 1), and 21 athletes were included in the non–SSN decompression group (group 2). The mean age was 27 years (range: 19-34) and 24 years (range: 21-32) in group 1 and group 2, respectively ($P = .56$). The mean follow-up time was 38.4 months (24-50 months) in group 1 and 42.2 months (26-53 months) in group 2 ($P = .09$). Both groups had significantly improved UCLA scores after surgery ($P < .05$). The postoperative UCLA ($P = .01$) and Constant scores ($P < .001$) were significantly higher in the SSN decompression group. The mean difference in Constant score between the affected and the unaffected side was 4 points (range: 2-12) in the SSN decompression group and 8 points (range: 4-14) in the non–SSN decompression group postoperatively ($P = .0002$). In both groups, 100% of patients reached the patient acceptable symptom state value for Constant score at follow-up. For the UCLA score, patients who underwent SSN decompression had significantly higher pre- to postoperative improvement than the nondecompression group ($P = .016$). The return to sport rate was 97% in group 1 and 84% in group 2. The mean length of career was 2.1 years (range: 1.5-2.4 years) and 2.3 years (range: 1.2-3.2 years) in group 1 and group 2, respectively.

Conclusions In elite overhead athletes with shoulder pathology and SSN entrapment, combined shoulder arthroscopy and SSN release yield superior clinical outcomes, greater improvement in UCLA score, and a higher return to sport rate than shoulder arthroscopy without SSN decompression. Regardless of SSN treatment, both groups achieved the patient acceptable symptom state after shoulder arthroscopy.

Level of Evidence *Level III, comparative case series.*

Groin injuries

Risk Factors for Groin Injury and Symptoms in Elite Level Soccer Players: A Cohort Study in the Dutch Professional Leagues

Authors: Rob Langhout, PT, MMT[1,3-6], Igor Tak, MSc, PT, MSc PT sports[3,4,6,7], Anne-Marie van Beijsterveldt, PhD, BEng[8], Martijn Ricken, MSc, PT[7], Adam Weir, MBBS, PhD[9,10], Maarten Barendrecht, MPTS[11], Gino Kerkhoffs, MD, PhD[2-4], Janine Stubbe, PhD[12]

Published: *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–30 **DOI:**10.2519/jospt.2018.7990

Study Design
Cohort study with prospective and retrospective elements.

Background
Groin injury and symptoms are common in soccer players. Their relationship with reduced hip range of motion (ROM) and previous injury is unclear.

Objectives
To conduct a retrospective assessment of associations between previous injury and pre-season hip ROM and pre-season prevalence of severe groin symptoms; and prospective identification of risk factors for within-season groin injury.

Methods
During 2015-2016, 190 players from 9 Dutch professional soccer clubs participated. Univariate and multivariate logistic regression were used to predict pre-season severe groin symptoms, identified using the Copenhagen Hip And Groin Outcome Score, from a history of previous groin injury, general injury (minimum 1 week duration) in previous season, and hip ROM. Cox regression was used to predict within-season groin injury.

Results
Point-prevalence of severe groin symptoms was 24% and within-season incidence of groin injury 11%. Total/training/match groin injury incidence was 0.5/0.2/2.6 injuries/1000 playing hours. A history of more than 1 previous groin injury was associated with current severe groin symptoms (Odds Ratio=3.0; 95% CI=1.0, 8.3; P=.038). General injury sustained in the previous season (ankle, knee, thigh, shoulder; median 9 weeks time-loss) was a risk factor for groin injury (Hazard Ratio=5.1; 95% CI=1.1, 14.6; P=.003).

Conclusion
Severe injuries in the previous season to locations other than the groin increase the risk of groin injury the next season. A history of groin injury is associated with current severe groin symptoms. Pre-season hip ROM does not identify players at risk for groin injury.

58. RUNNING

Running protocols

Progression in Running Intensity or Running Volume and the Development of Specific Injuries in Recreational Runners: Run Clever, a Randomized Trial Using Competing Risks

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Study Design
Randomized clinical trial, etiology.

Background
Training intensity and volume have been proposed to be associated with specific running-related injuries. If such an association exists, secondary preventive measures could be initiated by clinicians based on symptoms of a specific injury diagnosis.

Objectives
To test the following hypotheses: (i) A running schedule focusing on intensity will increase the risk of sustaining Achilles tendinopathy, gastrocnemius injuries and plantar fasciitis compared with hypothesized volume-related injuries. (ii) A running schedule focusing on running volume will increase the risk of sustaining patellofemoral pain syndrome, iliotibial band syndrome and patellar tendinopathy compared with hypothesized intensity-related injuries.

Methods
Healthy recreational runners were included in a 24-week follow-up, divided into 8-week preconditioning and 16-week specific focus-training. Participants were randomized to one of two running schedules: Schedule Intensity(Sch-I) or Schedule Volume(Sch-V). Sch-I progressed the amount of high intensity running (≥88% VO2max) each week. Sch-V progressed total weekly running volume. Global positioning system watch or smartphone collected data on running. Running-related injuries were diagnosed based on a clinical examination. Estimates were risk difference (RD) and 95%CI.

Results
Of 447 runners, a total of 80 sustained an injury (Sch-I n=36; Sch-V n=44). Risk of intensity injuries in Sch-I were: $RD_{2\text{-weeks}}$=-0.8%[-5.0;3.4]; $RD_{4\text{-weeks}}$=-0.8%[-6.7;5.1]; $RD_{8\text{-weeks}}$=-2.0%[-9.2;5.1]; $RD_{16\text{-weeks}}$=-5.1%[-16.5;6.3]. Risk of volume injuries in Sch-V were: $RD_{2\text{-weeks}}$=-0.9%[-5.0;3.2]; $RD_{4\text{-weeks}}$=-2.0%[-7.5;3.5]; $RD_{8\text{-weeks}}$=-3.2%[-9.1;2.7]; $RD_{16\text{-weeks}}$=-3.4%[-13.2;6.2].

Conclusion
No difference in risk of hypothesized intensity and volume specific running-related injuries exist between running schedules focused on progression in either running intensity or volume.

59. PAIN

Physical activity and attitude helps chronic pain

Physical and psychosocial factors in the prevention of chronic pain in older age
The Journal of Pain — Fancourt D, et al. | June 25, 2018

In order to identify multimodal activities that could be encouraged amongst older adults as part of a healthy lifestyle to reduce the incidence risk of chronic pain, researchers tracked 2,631 adults aged 50+ who were free from chronic pain at baseline across a decade using data from the English Longitudinal Study of Ageing. Outcomes suggested engaging in vigorous weekly activity as well as cultural engagement (going to museums/galleries/concerts) to be protective against the chronic pain in adults aged 50+. No protective effect was noted of moderate weekly activity and community group participation. Thereby suggesting the physical activity and psychosocial factors (such as positive affect) to be key factors in the long-term success of chronic pain self-management.

62 A. NUTRITION/VITAMINS

Inflammatory diet

European Journal of Nutrition pp 1–14|

Diet as moderator in the association of adiposity with inflammatory biomarkers among adolescents in the HELENA study

- Aline Arouca Luis A. Moreno Stefaan De HenauwAim

Our aim is to demonstrate that a healthy diet might reduce the relation between adiposity and inflammation, whereas an unhealthy diet may increase the effect of adiposity on inflammatory biomarkers.

Methods

In 618 adolescents (13–17 years) of the European HELENA study, data were available on body composition, a set of inflammation markers, and food intake determined by a self-administered computerized 24-h recall. A 9-point Mediterranean diet score and an antioxidant-rich diet score were used as dietary parameters and tested as moderator. Total body fat was represented by the sum of six skinfold thicknesses and central adiposity by waist circumference. A set of inflammation-related biomarkers was used as outcome: a pro/anti-inflammatory interleukins ratio, TGFβ-1, C-reactive protein, TNF-α, 3 cell adhesion molecules, and 3 types of immune cells; gamma-glutamyltransferase (GGT) and homocysteine were used as cardiovascular disease risk biomarkers, and alanine transaminase (ALT) as liver dysfunction biomarker. Multiple linear regression analyses tested moderation by diet in the adiposity-inflammation association and were adjusted for age, sex, country, puberty, socioeconomic status.

Results

Both the Mediterranean and antioxidant-rich diet, and overall and central adiposity, were important in the moderation. Diet was a significant protective moderator in the effect of adiposity on the pro/anti-inflammatory interleukins ratio, TGFβ-1, GGT, and ALT.

Conclusion

In conclusion, in some cases, a diet rich in antioxidants and essential nutrients may attenuate the concentration of inflammatory biomarkers caused by adiposity, whereas a poor diet appears to contribute to the onset of early oxidative stress signs.