

2. LBP

White matter changes in pain

Spine J. 2019 Aug 31. pii: S1529-9430(19)30961-1. doi: 10.1016/j.spinee.2019.08.015

Comparison of brain structure between pain-susceptible and asymptomatic individuals following experimental induction of low back pain.

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BACKGROUND CONTEXT:

Peripheral differences often do not adequately account for variation in reports of pain intensity in people with musculoskeletal pain.

PURPOSE:

Here we sought to determine the extent to which structural differences in the brain (grey matter density) of pain free individuals might relate to subsequent pain (or lack thereof) after standardized peripheral muscle injury (ie, micro trauma from high intensity exercise).

STUDY DESIGN:

This was an observational laboratory-based study that was a secondary analysis from a larger trial.

METHODS:

Participants completed baseline testing (functional MRI and quantitative pain testing) followed by high intensity trunk exercise to induce delayed onset muscle soreness in the erector spinae. Forty-eight hours later, back pain intensity ratings were collected and all participants were re-imaged. Grey matter density was determined using voxel-based morphometry. The "asymptomatic" group (no reports of any pain within 48 hours after induction) to a 'pain' group (rating of pain at rest and movement $pf > 20$ on a 101-point numeric rating scale).

RESULTS:

Our results revealed several large clusters where, compared to participants with pain, asymptomatic participants had significant greater grey matter density. These brain regions included left medial frontal gyrus, left middle occipital gyrus, left middle temporal gyrus, left inferior frontal gyrus, and right superior frontal gyrus.

CONCLUSIONS:

Lower grey matter density in brain regions previously linked to discriminative, emotional, and cognitive aspects of cortical processing are associated with reporting musculoskeletal pain after a standardized peripheral muscle injury.

CLINICAL SIGNIFICANCE:

Cortical gray matter density of people without any pain may influence response to a standardized high intensity exercise protocol. This finding adds further support to the relevance of central factors in explaining the tremendous individual variability in pain report following acute musculoskeletal injury.

7. PELVIC ORGANS/WOMAN'S HEALTH

C section and importance of activity

Pain. 2019 Oct;160(10):2350-2357. doi: 10.1097/j.pain.0000000000001628.

Recovery of physical activity after cesarean delivery and its relationship with pain.

Sharpe EE¹, Booth JL², Houle TT³, Pan PH⁴, Harris LC⁴, Aschenbrenner CA⁴, Eisenach JC⁴. Pain and physical activity are tightly intertwined. Although their relationship has been explored in chronic pain conditions, we know little about the pattern of recovery in activity and its short- and long-term relationship with pain after surgery.

We recruited 103 women undergoing elective cesarean delivery and acquired daily pain assessments and hourly steps in 98 of them for 2 months after surgery. Compliance was good, with 78% of subjects missing less than 7 days of activity. Study personnel required daily checking for compliance and 20 minutes per subject per week in study. Activity increased over the first 2 postoperative months in a log(time) manner. The slope of each modeled individual curve for activity was inversely correlated ($r = -0.54$; $P < 0.0001$) with worst daily pain. After removing these 2-month trends, pain and activity within an individual day were negatively associated with each point increase in pain being inversely associated with -119 steps (95% confidence interval [CI] = -214 to -25; $P = 0.013$). A patient's previous experience of pain was not associated with current activity as well as current activity was not associated with future pain scores.

These data, although limited by the study of a single operation in a unique social circumstance with low risk of chronic postsurgical pain, demonstrate feasibility of measuring hourly activity for 2 months after surgery. Recovery from pain and inactivity are tightly correlated, and the negative relationship between within-day pain and activity without interday carryover relationships is in stark contrast to findings in chronic pain conditions.

11. UPPER C SPINE

Head position and blood flow

J Orthop Sports Phys Ther. 2019 Oct;49(10):688-697. doi: 10.2519/jospt.2019.8578. Epub 2019 Jul 5.

Effects of Head and Neck Positions on Blood Flow in the Vertebral, Internal Carotid, and Intracranial Arteries: A Systematic Review.

Kranenburg HAR, Tyer R, Schmitt M, Luijckx GJ, van der Schans C, Hutting N, Kerry R.

Abstract

BACKGROUND:

Manual therapy interventions targeting the neck include various positions and movements of the craniocervical region. The hemodynamic changes in various spinal positions potentially have clinical relevance.

OBJECTIVES:

To investigate the effects of craniocervical positions and movements on hemodynamic parameters (blood flow velocity and/or volume) of cervical and craniocervical arteries.

METHODS:

A search of 4 databases (PubMed, Embase, CINAHL, and Index to Chiropractic Literature) and, subsequently, a hand search of reference lists were conducted. Full-text experimental and quasi-experimental studies on the influence of cervical positions on blood flow of the vertebral, internal carotid, and basilar arteries were eligible for this review. Two independent reviewers selected and extracted the data using the double-screening method.

RESULTS:

Of the 1453 identified studies, 31 were included and comprised 2254 participants. Most studies mentioned no significant hemodynamic changes during maximal rotation ($n = 16$). A significant decrease in hemodynamics was identified for the vertebral artery, with a hemodynamic decrease in the position of maximum rotation ($n = 8$) and combined movement of maximum extension and maximum rotation ($n = 4$). A similar pattern of decreased hemodynamics was also identified for the internal carotid and intracranial arteries. Three studies focused on high-velocity thrust positioning and movement. None of the studies reported hemodynamic changes. The synthesized data suggest that in the majority of people, most positions and movements of the craniocervical region do not affect blood flow.

CONCLUSION:

The findings of this systematic review suggest that craniocervical positioning may not alter blood flow as much as previously expected.

LEVEL OF EVIDENCE:

Therapy, level 2a. *J Orthop Sports Phys Ther* 2019;49(10):688-697. Epub 5 Jul 2019. doi:10.2519/jospt.2019.8578.

14. HEADACHES

Genetic migraine

Headache. 2019 Sep 26. doi: 10.1111/head.13651.

Migraine Genetic Variants Influence Cerebral Blood Flow.

Knol MJ¹, Loehrer EA¹, Wen KX¹, Bos D^{1,2}, Ikram MK^{1,3}, Vernooij MW^{1,2}, Adams HHH^{1,2,4}, Ikram MA¹.

OBJECTIVE:

To investigate the association of migraine genetic variants with cerebral blood flow (CBF).

BACKGROUND:

Migraine is a common disorder with many genetic and non-genetic factors affecting its occurrence. The exact pathophysiological mechanisms underlying the disease remain unclear, but are known to involve hemodynamic and vascular disruptions. Recent genome-wide association studies have identified 44 genetic variants in 38 genetic loci that affect the risk of migraine, which provide the opportunity to further disentangle these mechanisms.

METHODS:

We included 4665 participants of the population-based Rotterdam Study (mean age 65.0 ± 10.9 years, 55.6% women). Cross-sectional area (mm^2), flow velocity (mm/s), and blood flow (mL/min) were measured in both carotids and the basilar artery using 2-dimensional phase-contrast magnetic resonance imaging. We analyzed 43 previously identified migraine variants separately and calculated a genetic risk score (GRS). To assess the association with CBF, we used linear regression models adjusted for age, sex, and total brain volume. Hierarchical clustering was performed based on the associations with CBF measures and tissue enrichment.

RESULTS:

The rs67338227 risk allele was associated with higher flow velocity and smaller cross-sectional area in the carotids ($P_{\text{minimum}} = 3.7 \times 10^{-8}$). Other variants were related to CBF with opposite directions of effect, but not significantly after multiple testing adjustments ($P < 1.4 \times 10^{-4}$). The migraine GRS was not associated with CBF after multiple testing corrections. Migraine risk variants were found to be enriched for flow in the basilar artery ($\lambda = 2.39$).

CONCLUSIONS:

These findings show that genetic migraine risk is complexly associated with alterations in cerebral hemodynamics.

CBT helps

Does mindfulness-based cognitive therapy for migraine reduce migraine-related disability in people with episodic and chronic migraine? A phase 2b pilot randomized clinical trial

Headache: The Journal of Head and Face Pain — Seng EK, Singer AB, Metts C, et al. | October 01, 2019

Researchers conducted the current phase 2b study investigating the efficacy of mindfulness-based cognitive therapy for migraine (MBCT-M) in decreasing migraine-related disability in people with migraine.

In MBCT, mindfulness meditation and cognitive-behavioral skills are taught and these skills are directly applied to address disease-related cognitions. They randomized 60 participants with migraine (6-30 headache days/month) to receive MBCT-M (n = 31) or waitlist/treatment as usual (n = 29). The MBCT-M group showed more reduction in the headache disability inventory mean scores from month 0 to month 4 (-14.3) than the waitlist/treatment as a usual group (-0.2). In addition, the MBCT-M group indicated a decrease in mean Migraine Disability Index scores (-0.6/10), whereas the waitlist/treatment as a usual group had an increase in these scored (+0.3/10).

These findings support the efficacy of MBCT-M in reducing headache-related disability and attack-level migraine-related disability. MBCT-M was thus supported as a promising emerging treatment for addressing migraine-related disability.

52. EXERCISE

High intensity ex helps weight loss

The impact of different intensities of exercise on body weight reduction and overactive bladder symptoms- randomised trial

European Journal of Obstetrics & Gynecology and Reproductive Biology — Hagovska M, et al. | October 03, 2019

Researchers examined how a 3-month exercise program with two different intensities influence the body weight and body fat percentage in overweight women with overactive bladder symptoms (OAB).

In this randomized controlled study, 77 overweight women with OAB symptoms (average age of 26.2 years) were randomized into two groups:

Group 1 (program with high intensity) (n = 39) and group 2 (program with low intensity) (n = 38). They observed body weight loss and a reduction in Body Fat Percentage of more than 5% in group 1, but not in group 2. Outcomes revealed a significant reduction in overweight and mild symptoms of OAB after 12 weeks in correlation with the high-intensity exercise program for reducing abdominal fat.

59. PAIN**Smoking makes a lot worse**

Pain. 2019 Oct;160(10):2374-2379. doi: 10.1097/j.pain.0000000000001631.

Effects of smoking on patients with chronic pain: a propensity-weighted analysis on the Collaborative Health Outcomes Information Registry.

Khan JS¹, Hah JM², Mackey SC².

Tobacco smoking is associated with adverse health effects, and its relationship to pain is complex. The longitudinal effect of smoking on patients attending a tertiary pain management center is not well established. Using the Collaborative Health Outcomes Information Registry of patients attending the Stanford Pain Management Center from 2013 to 2017, we conducted a propensity-weighted analysis to determine independent effects of smoking on patients with chronic pain. We adjusted for covariates including age, sex, body mass index, depression and anxiety history, ethnicity, alcohol use, marital status, disability, and education. We compared smokers and nonsmokers on pain intensity, physical function, sleep, and psychological and mood variables using self-reported NIH PROMIS outcomes. We also conducted a linear mixed-model analysis to determine effect of smoking over time. A total of 12,368 patients completed the CHOIR questionnaire of which 8584 patients had complete data for propensity analysis. Smokers at time of pain consultation reported significantly worse pain intensities, pain interference, pain behaviors, physical functioning, fatigue, sleep-related impairment, sleep disturbance, anger, emotional support, depression, and anxiety symptoms than nonsmokers (all $P < 0.001$). In mixed-model analysis, smokers tended to have worse pain interference, fatigue, sleep-related impairment, anger, emotional support, and depression over time compared with nonsmokers.

Patients with chronic pain who smoke have worse pain, functional, sleep, and psychological and mood outcomes compared with nonsmokers.

Smoking also has prognostic importance for poor recovery and improvement over time. Further research is needed on tailored therapies to assist people with chronic pain who smoke and to determine an optimal strategy to facilitate smoking cessation.

63. PHARMACOLOGY

Opioid use and obesity

The contribution of obesity to prescription opioid use in the United States

Pain — Stokes A, Berry KM, Collins JM, et al. | September 30, 2019

ADVERTISEMENT

In this cross-sectional study, researchers investigated how obesity influence prescription opioid use among adults aged 35 to 79 years using data from the National Health and Nutrition Examination Survey (NHANES, 2003-2016).

The analysis revealed elevated odds of prescription opioid use in correlation with body mass indices in the overweight {odds ratio (OR), 1.11}, obese I (OR, 1.26), obese II (OR, 1.69), and obese III (OR, 2.33) categories when compared with normal weight. For chronic opioid use vs for use with a duration of less than 90 days, stronger association between excess weight and opioid use was observed. As per estimations, obesity attribute to about 14% of prescription opioid use at the population level. Across obesity status, back pain, joint pain, and muscle/nerve pain deemed for the largest disparities in self-reported reasons for prescription opioid use.

These findings suggest that the high prevalence of prescription opioid use in the United States is partially due to the obesity epidemic.