

Nick

No difference on quantitative magnetic resonance imaging in patellofemoral cartilage composition between patients with patellofemoral pain and healthy controls.

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In the introduction the authors highlight that the specific mechanism of pain in a most common condition, patellofemoral pain (PFP), is thought to be multifactorial but largely still uncertain. Retropatellar cartilage damage has been hypothesized to be one such etiological factor, however to date research has yet to conclusively correlate morphologic cartilage damage as viewed on MRI and PFP. The authors note that cartilage *composition* changes usually precede morphologic changes. Two small studies have examined cartilage composition in patients with PFP compared to controls, however these studies had significant design flaws. Therefore, the purpose of this study was to examine differences in patellofemoral cartilage composition between patients with PFP and controls using the most modern MRI technology.

Patients with PFP were included if they had pain duration of more than 2 months but less than 2 years, were between the ages of 14 and 40, and had knee pain with select activities (e.g., running, stair negotiation, squatting). Exclusion criteria included a specific pathological diagnosis or if PFP was precipitated by trauma. There was intent to match subjects with PFP with control subjects who were similar in age, BMI, sex, and activity level.

All subjects underwent a standard physical examination and MRI. In patients over the age of 18, contrast was used as this preferably demonstrates glycosaminoglycan content. A detailed description of the standardized MRI procedure and interpretation is provided. 64 patients with PFP and 70 controls participated in the study. There were 20 adolescents in each group.

No significant differences in any MRI parameters (T1_{GD}, T1 and T2 relaxation times) were found between patients with PFP and controls. When analyses was conducted for specific subgroups (i.e., medial and lateral sub regions, adults vs. adolescents), no significant differences were found.

The authors comment that though it was not statistically significant, there was a trend for higher T1 relaxation times in the adolescent PFP group compared to adolescent controls. This association was determined to be statistically significant in a prior study, although the reference population was more specific (e.g, patellar maltracking). The authors draw attention that clinically relevant differences could not be ruled out on the basis of the 95% confidence intervals.

In conclusion, this study demonstrated that patellofemoral cartilage composition is not different between those with and without patellofemoral pain. This serves as another piece of evidence indicating that it is the clinical exam, and not the imaging findings, that should receive

greater weight when evaluating a patient. It also potentially serves to confirm that the pain producing substance in patients with patellofemoral pain is perhaps more related to soft tissue structures (e.g., retinaculum, fat pad) than cartilage/bony structures.

Sean

Dynamic Single-Leg Postural Control Is Impaired Bilaterally Following Anterior Cruciate Ligament Reconstruction: Implications for Reinjury Risk

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Assessing a patient's performance during a single-leg squat is routinely practiced to test dynamic functional stability. Dynamic stability is accomplished by multiple systems working together, systems such as vision, vestibular, somatic and proprioception. Proprioceptive input to the brain is thought to be disrupted following ACL reconstruction due to the disruption in the mechanoreceptors in the ligament, as well as proprioceptive loss due to inactivity and muscle weakness. The purpose of this study is to determine whether dynamic postural control during a single-leg squat is impaired following ACL reconstruction compared with the uninjured contralateral limb and health controls.

Participant inclusion for this study consisted of volunteers 12 to 15 months post-ACLR between the ages of 18 and 50 years at time of surgery. The control group consisted of young healthy adults between 18 and 40 years of age and run regularly for 12 miles per week for exercise or in sport. Single-leg squat was tested while patients stood on a Nintendo Wii Balance Board and repeated for 5 repetitions. Dynamic balance was measured by center of pressure movement in the mediolateral and anteroposterior directions, as well velocity of movement.

It comes as no surprise that the ACLR group demonstrated significantly worse dynamic balance on the surgical limb compared to the healthy control group. However, dynamic balance during single-leg squat was similar between the ACLR limb and the uninjured contralateral limb. This is important for us to be aware of as clinicians when we are observing these patients, making assessments and setting goals. This poses the question of whether this impaired dynamic balance predisposed this population to an ACL injury, or if it was a result of the injury and subsequent surgery. Nevertheless, it supports the need to focus training and improving dynamic balance of the contralateral limb to decrease risk of re-rupture of the surgical limb and injury to the contralateral limb as well.

Oksana

Validity of pain drawings for predicting psychological status outcome in patients with recurrent or chronic low back pain

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Our pain perceptions have a HUGE impact on outcomes and prognoses. There's a study where patients draw a picture of what their pain looks/ feels like for them. Those who drew drastic obnoxious pictures had a worse prognoses and depression was not uncommon. Our view of pain has an enormous influence on us! The purpose of the study is to analyze the relationship between pain drawings and future psychological status. A strong correlation with patients with an abnormal PSS drawing at baseline had a significantly greater rate of depression, somatization and distress at a one-year follow up.

Methods: prospective cohort study 138 patients with current/ recurrent low back pain (RCLBP). Participants were asked to complete a drawing of their current back pain at baseline and were reassessed one-year later using relative risk statistics. Other outcome measures include: the Modified Somatic Perceptions Questionnaire; modified Zung Depression Scale; and Distress and Risk Assessment Method. Pain drawings were analyzed quantitatively using the Pain Sites Score (PSS) and Simple Body Region (SBR) method. Inclusion criteria: patients who present with a new episode of LBP and has experienced similar LBP before, the first episode of which was at least 3 months before the date of recruitment. Exclusion criteria: spinal surgery within the previous 6 months, history of traumatic fracture, neurological deficits or psychiatric disease, under 20 yo or pregnant.

This article is important as it helps us make better prognoses and managing decisions for our patients. I think it's important to quote this study with patients to see how their perception can actually change their outcomes. If patients are more apprehensive or depressed, I think it's important to have a place to refer them to either a psychologist or pain management doctor.

Alex

Cervicothoracic junction thrust manipulation in the multimodal management of a patient with temporomandibular disorder

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This case study describes the integration of thrust manipulation if the cervicothoracic junction in a patient with temporomandibular disorder and correlational, or possibly causational effects on pain and function.

TMD has been linked to craniocervical and cervical segmental dysfunction and there have been some reports suggesting that treatment to those areas can positively affect pain and function in the TMJ. Based on the biomechanical interaction between the TMJ, cervical spine and CTJ, it is plausible that addressing mobility limitations at the CTJ could directly affect the TMJ.

However, the patient described in this case presents with several areas of pain (fig. 1), with bilateral diffuse pain at high intensities, as well as psychosocial factors, which could possibly affect perception and processing of pain. Additionally, the patient has been diagnosed and treated for fibromyalgia, which could further contribute to alterations in pain processing. In addition to the CTJ thrust manipulation, treatments consisted of patient education, TMJ mobilizations, STM to surrounding musculature intra and extraorally, as well as therapeutic exercise and neuromuscular re-education.

The patient was seen seven times over an eight week period and demonstrated statistically significant changes in NDI, NPRS and GROCC, as well as pain pressure threshold readings over the most affected area (left masseter).

Despite the expected limitations of a single subject case report, as well as the patient's additional confounding factors, the positive outcomes in combination with the biomechanical relationship between CTJ and TMJ warrant further investigation. Furthermore, these results appear clinically applicable and CTJ should be assessed and possibly treated, if matched with the appropriate patient based on presentation, especially in patients with non-traumatic onset of symptoms.

Laura

Running retraining to treat lower limb injuries: a mixed-methods study of current evidence synthesized with expert opinion

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Weeding through validity, relevancy, and practicality of studies can be overwhelming, especially with a dense topic. Finding the what, how, why, and when of running retraining is a difficult task, especially due to the extensive strategies and injuries that can be addressed. We tend to rely heavily on peers and expert opinions through similar case studies and past successes, since literature is lacking for retraining for certain injured populations. The level of evidence is based on a hierarchy of quality, and rarely does the different levels of evidence combine. A recent study in the British Journal of Sports Medicine has adopted this mixed-method design to provide us with both a well-organized and comprehensive systematic review on current literature on running retraining, as well as interviews with 16 experts around the world on implementation of running retraining for different injured populations and biomechanical principles.

The literature review component of this study compiled 46 studies on running retraining from 1983 – 2015. The authors break down each study by design, sample, outcomes, intervention, and significant biomechanical results. They also categorize each study into important biomechanical effects of a specific retraining strategy, which include increasing step rate, alternating strike pattern, changing proximal kinematics (trunk/hip position), and reducing impact loading variables. In Supplementary File 5, 6, 7, and 8, each retraining strategy is paired with the biomechanical effects, its associated studies, and supporting level of evidence.

The expert panel addresses the same biomechanical effects of each strategy as previously mentioned, as well as opinions on how to address different injured populations and advantages and pitfalls of using retraining techniques. The authors of the study then organize each injured population with the expert opinions and the biomechanical principles for the retraining strategies proposed for each population. For example, retraining strategies for calf pain are listed as increasing step rate and transitioning from a forefoot to a rear foot strike for decreasing plantar-flexor force production and decreasing ankle dorsiflexion at mid-stance, but the authors generally agree on addressing strength and endurance deficits as important (if not more so) than retraining.

This article provides an extensive, yet organized summary for running retraining that can provide therapists with a framework for considering strategies and principles to address. The level of detailed organization in these charts is extremely helpful and allow easy accessibility to the data published. Expert opinion and research are the pillars to evidence-based practice, and with addition of patient preference and input, will provide the best results and satisfaction. I highly recommend this article for therapists, novice and experienced alike.