

February 2016 End of Month Review

Oksana

Increased duration of co-contraction of medial knee muscles is associated with greater progression of knee osteoarthritis Paul W. Hodges a, b, * , Wolbert van den Hoorn a , Tim V. Wrigley b , Rana S. Hinman b , Kelly-Ann Bowles b , Flavia Cicuttini c , Yuanyuan Wang c , Kim Bennell b *Manual Therapy*. 2016

Knee osteoarthritis (OA) is a progressive irritation that will get worse if someone doesn't take action. Knee muscle activation has a potential role in affecting OA. Coordinating muscle activation is a determinant of how one loads their knee. Those who have knee OA have a tendency to bias their medial knee muscles therefore loading the medial knee joint. It has been found that greater medial muscle co-contraction was correlated to decreased medial tibial cartilage volume loss, while lateral muscle co-contraction was inversely correlated. The purpose of this study was to find if biasing muscle co-contraction to medial muscle would be associated with greater loss of medial cartilage volume while co-contracting lateral muscles would be protective.

Study design: 50 participant with symptomatic medial knee OA, Inclusion criteria: age > 50, average knee pain on walking > 3 on a 11-point numerical scale, pain located mover medial knee compartment, medial compartment osteophytes or medial joint space narrowing on x-ray. Exclusion criteria: predominant patellofemoral joint symptoms or clinical examination (indicated by pain location, pain provoking activities, tenderness on palpation, pain during patella mobilization, knee surgery or intraarticular corticosteroid injection within 6 months, current or past (within 4 weeks) oral corticosteroids, systemic arthritic conditions, history of knee arthroplasty or osteotomy, other musculoskeletal or neurological condition affecting lower limb and regular use of gait aid. Muscle activation was measured with surface electrodes from the lateral bicep femoris and vastus lateralis and medial semimembranosus, vastus medialis. Measurements were taken during natural speed walking at baseline. Medial tibial cartilage volume was measured from an MRI at baseline and 12 months.

It was found that greater medial muscle co-contraction was correlated to decreased medial tibial cartilage volume loss, while lateral muscle co-contraction was inversely correlated with cartilage loss. Exercises and interventions need to focus on changing knee muscle activation patterns. It's important to observe a patient's gait pattern. This study points out how people with knee OA are at risk for progression of OA with a varus alignment. I need to learn how to cue/train the lateral muscle compartment in order to decrease the forces on the medial knee joint therefore potentially slowing the progression of knee OA.

Laura

Corticosteroid Injections Accelerate Pain Relief and Recovery of Function Compared with Oral NSAIDS in Patients with Adhesive Capsulitis: A Randomized Controlled Trial

Maximiliano Ranalletta, Luciano A. Rossi, Santiago L. Bongiovanni, Ignacio Tanoira, Cristina M. Elizondo and Gaston D. Maignon

Am J Sports Med 2016 44: 474

In the latest publication of The American Journal of Sports Medicine, Ranalletta et. al. have published a randomized controlled trial on the effects of landmark-guided interarticular corticosteroid injections and physical therapy vs. oral NSAIDS and physical therapy in the short term for Stage II adhesive capsulitis. All patients performed a rehabilitation protocol 3 times a week for 12 weeks, with half of the patients randomized to receive a single corticosteroid injection in the glenohumeral joint at the beginning of the study and the other half prescribed oral NSAIDS (diclofenac 75 mg). Clinical outcomes were documented before treatment, at 2, 4, 8, and 12 weeks for pain (VAS), functional outcome measures (ASES, QuickDASH, and Constant-Murphy score), and passive ROM.

The results of the study followed previous literature findings in that corticosteroid injections have a significant effect on pain, function, and PROM in the short term, however there are no significant differences in any outcome measure past 12 weeks. Two systematic reviews ^{1,2} published in the past 5 years also concluded similar findings that support corticosteroid injections as adjunct treatments in the initial stages, however may not provide added benefits to physical therapy in the mid-to-long term. The most recent clinical practice guidelines released by the Orthopedic Section of the APTA also gives an “A” strength rating to corticosteroid injections within the first 4-6 weeks in conjunction with shoulder mobility and stretching exercises.

In the current study, the control group (PT and oral NSAIDS) had significant improvements in pain levels at each follow-up point, with achieving an average of 6.5 point decrease on VAS at 12 weeks. This group achieved this result at a slower, but steadier rate than the corticosteroid group, who had the greatest decline between 0-4 weeks but then slowed improvement between 4 and 12 weeks. A similar trend was found with all functional scores (ASES, QuickDASH, and Constant-Murphy score) and PROM measurements, where improved significantly at all time points for both groups, however the intervention group had the greatest difference initially between 0-4 weeks, then plateaued in the later stages of the treatment where the control group had a consistent incline throughout treatment.

Corticosteroid injections may have an additional benefit in shoulder pain and function for the first several weeks when patients have the most pain, however beyond this time point, it may not provide significant added benefit. The focus of this study was on the effects of a landmark-guided injection compared with oral NSAIDs. There was little detail in the specific rehabilitation

protocol which would have been ideal to see as a physical therapist, however it was provided that the patients received a progression based on pain and ROM improvements. Prescription and consultation for medication is out of the scope of practice for physical therapists in the United States, however knowledge of current literature related to outcomes in physical therapy may assist patients with communication with physicians and treatment decision-making. When patients have difficulty with completing appropriate exercises or movements in initial or painful phases of adhesive capsulitis, it may be appropriate to refer patients for corticosteroid injections to allow patients to move faster through rehabilitation.

1. Adhesive Capsulitis of the Shoulder: A Systematic Review of the Effectiveness of Intra-Articular Corticosteroid Injections. *J Bone Joint Surg Am*, 2011 Sept 21; 93(18):1727-1733

2. Glenohumeral Corticosteroid Injections in Adhesive Capsulitis: A Systematic Search and Review. Song A, Higgins LD, Newman J, Jain NB. *PM R* 2014 Jul 4: 1-14

Nick

Ojha HA, Wyrsta NJ, Davenport TE, Egan WE, Gellhorn AC. Timing of physical therapy initiation for non surgical management of musculoskeletal disorders and effects on patient outcomes: a systematic review. *J Ortho Sport Phys Ther*. 2016; 46(2):57-70.

The purpose of this systematic review was very clear: to review the published literature regarding early versus delayed physical therapy for musculoskeletal conditions and the relative effects regarding patient outcomes and cost.

Although 3135 articles were scanned for relevance, only 14 were deemed appropriate for the final review. Interestingly, all 14 articles examined early versus delayed treatment of neck and low back pain; that is, there were no studies examining early versus delayed PT for other musculoskeletal conditions (e.g., ankle sprain).

There was low grade evidence that early initiation of PT was associated with reduced cost (~\$1200-2700 lower), medical utilization (advanced imaging, surgeries, injections, physician visits, opioid medications), and reduced indemnity and sick leave with improved ability to lift and carry in work related injuries.

There was low to very low grade evidence that there are no differences in body functions and non-work related disability and function between those who receive early vs. delayed physical therapy.

The authors wisely draw attention to the fact that in all studies considered, early physical therapy was *never* associated with decreased patient outcomes or an increase in cost/medical utilization.

The authors conclude by stating, “physical therapy should be initiated as early as is feasible to minimize cost, medical utilization, and potential iatrogenic harm.”

I choose this article for our discussion board post this month, not only because I was interested in it's content, but because I thought it would provide for some good reflection and discussion. A few questions to consider:

-Why do you suspect that the current U.S. medical guidelines include waiting to refer patients for physical therapy for spinal related pain 6 weeks after onset of symptoms? Are there times when taking a “wait and see” approach are appropriate? Why or why not/any examples?

- There was a noted reduction in cost and medical utilization, however not in function or disability (with the exception of quicker return to work). Why do you suppose this to be the case? In other words, how do our services work to reduce cost and subsequent medical utilization yet at the same time may not be so effective at reducing pain and disability?
- What are the current barriers to early referral for physical therapy?
- Are there other conditions that would make for good studies regarding the efficacy of early versus delayed PT, seeing that there currently are none published?

Alex

Gabbett TJ. The training-injury prevention paradox: should athletes be training smarter and harder?. Br J Sports Med. 2016;50(5):273-80.

doi:10.1136/bjsports-2015-095788

Purpose:

- Analysis of the “Training-Injury Prevention Paradox”, which describes fewer injuries in athletes accustomed to high workloads as compared to athletes training at lower workloads.
- Outline of monitoring training loads, comprised of internal and external loads and assessment relationship between acute and chronic training loads to analyze and help predict risk of injury.
- Assess whether high, or low training loads correlate with increased risk of injury

Methods:

- External training loads – objective measure of training performance (distance, weight, intensity, frequency)
- Internal training loads – subjective measure of physiological or perceptual response to training (RPE); training load is calculated by RPE x session duration = “exertional minutes”/“arbitrary units”
- Acute training load –measured as ‘fatigue’; related to 1 session, or 1 week in team sports
- Chronic training load – measured as ‘fitness’; calculated average of 3-6 weeks
- Athlete preparedness = acute:chronic workload ratio

Results:

- Injury prediction model with elite league rugby players using arbitrary units
 - 50-80% likelihood to sustain injury in preseason within a training load range of 3000-5000 arbitrary units
 - 2 year prospective study – attempting to predict non-contact soft tissue injuries (N=159)
 - True positive predictions = 62% (N=121)
 - False positive predictions = 13% (N=20)
 - False negative predictions = 11% (N=18)
 - Players exceeding weekly training threshold were 70 times more likely to sustain non-contact ST injury
 - Players within weekly training threshold were injured 1/10 as often
 - Prevalence of injury = 8.6%
 - (+) Predictive equation for a player – 8.6% increased to 86%
 - (-) Predictive equation for a player – 8.6% decreased to 0.1%
 - Out of 8.6% injured players, 87% were correctly identified by the injury prediction model
 - Limitation – training-dose response relationship specific to elite rugby league players
- Acute:chronic training load ratio to predict likelihood of injury
 - In elite cricket fast bowlers
 - Fatigue:Fitness ratio
 - A:C ratio ≤ 0.99 – likelihood of injury = 4% over next 7 days
 - A:C ratio ≥ 1.5 – likelihood of injury = 2-4 times greater over next 7 days
 - Results from a collection of data from cricket, Australian football and rugby league
 - Training “sweet spot” - A:C ratio = 0.8-1.3
 - Limitation – different sports may have different training load-injury relationships

Discussion:

The article describes common relationships between high and low training loads and increased risk for injury, either due to overuse, or not being prepared well enough for competition. The author takes a very eclectic approach and presents the information in a way that is relevant to physicians, physical therapists, strength and conditioning coaches and other professionals working with high-level athletes.

The author describes different ways to attempt to predict likelihood of injury depending on training load over different time frames. The results presented are based on very specific populations and may not be relevant, or accurate for different sports. However, these results and methods are a good reference point and may provide some guidance with training load dosage in different athlete populations. Further studies are needed to find specific sets of data for specific athlete populations.

Considering physical therapists' ever-increasing role in prevention and functional training, being familiar with predictive measures for injury risk, as well as being able to devise appropriate training programs is incredibly important. While these results may not be applicable to a non-athletic

population, using these concepts may be beneficial for treatment planning and appropriate progression of therapeutic exercises.

Sean

Journal of Manual and Manipulative Therapy 2015, Vol. 23, No. 5

Inter-rater reliability and validity of the screenassist lumbar questionnaire (SALQ): a pilot study

[Inter rater reliability and validity of the screenassist lumbar questionnaire a pilot study.pdf](#)

Purpose:

- 1) Determine if the SALQ score and associated recommendation for referral correspond with the results of the assessment by an internal medicine physician managing patients with a primary complaint of LBP; 2) Assess the validity and reliability of the SALQ to determine if PT's could use this tool as a formal instrument to assist with identifying patients with non-musculoskeletal back pain, or emergent MSK causes of back pain, that would assist in the clinical reasoning process and decision making to refer a patient to another medical provider.
- The SALQ is a 29 item questionnaire, each item with a possible score of 0-5 regarding non-MSK conditions such as DM, gastrointestinal, neurologic, genitourinary, etc. The 0-5 score rates the severity of symptoms. See Appendix A of this article to review specifics of questionnaire and a guide for recommendations to consider based on score.

Methods:

24 participants.

Inclusion Criteria: 1) LBP w/ or w/out LE symptoms, 2) pain more than 24hrs, 3) age >18, 4) able to read and understand English, 5) alert and oriented x4.

Test: Consultation performed by internal medicine physician followed by two phone conversations by a physical therapist and then a nurse to perform the SALQ.

Results:

The Physical Therapist recommended 13 of the 24 participants be referred to a physician. Ten of the 24 individuals presented with non-MSK or emergent MSK back pain. Statistical analysis performed in this study demonstrates that if the SALQ recommends referral to an alternate healthcare provider, there is a 74.5% chance that a non-MSK or emergent MSK diagnosis is present and if it does not recommend a referral, there is a 4% chance that the patient does not have a diagnosis of MSK pain.

Discussion and Reflection:

It is relevant to note that the author of this study did assist with the development of the SALQ. I appreciate the intentions of the author to provide physical therapists (MSK specialists) with tools to screen for non-MSK conditions as our profession progresses with autonomous practice under direct access. I agree with the author that this tool does not replace the clinical reasoning process, but rather add information to support our reasoning. If anything, I feel this tool serves as a good reference for therapists to help guide our Red Flag questioning and can help us communicate our findings more clearly to physicians.