Ridder et al. (2017) Hip Strength as an Intrinsic Rick Factor for Lateral Ankle Sprains in Youth Soccer Players. *AJSM*, doi: 10.1177/0363546516672650

Review submitted by Justin Bittner

Purpose:
To examine whether or not hip muscle strength is a risk factor for youth soccer players to sustain a lateral ankle sprain.

Methods:
A prospective case control study consisting of 140 male youth soccer players (10-16 years old). All participants played in a national league in their specific age groups. To be included in the study they could not be injured at the start of the study and could not have had a LE injury in the last 6 months. Also, no history of LE surgery. Participant demographics and BMI was calculated for each participant. All hip strength measurements were taken using a hand held dynamometer. Two 5 second isometric contractions were performed for each muscle group and average was taken. For every injury during the season the date, type, diagnosis, and site were documented. An injury in this study was defined as a "physical complaint that prohibited the player to participate in practices or games for at least 48 hours". Ankle injuries were rated as mild, moderate or severe based on duration of return to play.

Results:
A total of 12 participants sustained a lateral ankle sprains, representing 18% of all injuries reported. The mean time loss due to the injuries was 22.4 days, classifying them as moderate. Hip muscle forces were adjusted based on body size dependencies. Following multivariate Cox regression, the only independent risk factor for lateral ankle sprains was posterior chain muscle force. No other variables could be identified as a risk factor for lateral ankle sprains.

Conclusions:
Decreased hip extension strength was identified as an independent risk factor for sustaining a lateral ankle sprain in you male soccer players. Therefore, assessing hip extension strength may be indicated for screening protocols and prevention programs.

Comments:
One thing that is nice about this study is that it can easily be implemented into clinical practice. Although, a full lower quarter functional screen and strength testing would be performed when screening a patient, this particular study can potentially help with efficiency. However, obviously an isometric strength test on a table does not necessarily carry over into a dynamic activity such as soccer; to be used as a screening tool. I felt the authors did a good job describing the potential reason hip extension strength could increase lateral ankle sprains. They discuss that when fatigue occurs the shock absorbing muscle work is re-distributed from distal to proximal, meaning the larger more proximal muscles have to work harder. Without the smaller stabilizing muscles working to their full capacity during times of fatigue, the reliance on passive structures would be higher for stabilization in the ankle, thus, increasing the risk of an ankle sprain. In regards to the study, since there was no group to compare to, it is hard to make a firm conclusion that hip strength impairments could cause a lateral ankle sprain. Future studies with larger sample sizes would be needed to make a more.

Treleaven, J., Peterson, G., Ludvigsson, M. L., Kammerlind, A. S., & Peolsson, A. (2016). Balance, dizziness and proprioception in patients with chronic whiplash associated disorders complaining of dizziness: a prospective randomized study comparing three exercise programs. *Manual Therapy*, 22, 122-130.

Review submitted by Erik Lineberry

Objective: To compare the effect of 3 exercise programs on balance, dizziness, proprioception and pain in patients with chronic whiplash complaining of dizziness.

Methods: One hundred and forty subjects were randomized to either a physiotherapist-guided neck specific exercise (NSE), physiotherapist-guided neck-specific exercise, with a behavioural approach (NSEB) or prescription of general physical activity (PPA) group. Pre intervention, 3, 6 and 12 months post baseline they completed the University of California Los Angeles Dizziness Questionnaire (UCLA-DQ), Visual Analogue Scales (VAS) for, dizziness at rest and during activity and physical measures (static and dynamic clinical balance tests and head repositioning accuracy (HRA)).

Results: There were significant time by group differences with respect to dizziness during activity and UCLA-Q favouring the physiotherapy led neck specific exercise group with a behavioural approach. Within group analysis of changes over time also revealed significant changes in most variables apart from static balance.

Conclusions: Between and within group comparisons suggest that physiotherapist led neck exercise groups including a behavioural approach had advantages in improving measures of dizziness compared with the general physical activity group, although many still complained of dizziness and balance impairment. Future studies should consider exercises specifically designed to address balance, dizziness and cervical proprioception in those with persistent whiplash.

Commentary: I was hoping this article would delve into treatment of dizziness in patients following a MVA. I feel like they missed the boat by not adding any interventions specifically for these symptoms as I do not feel like neck-specific exercises would do much good for dizziness. The article even states that screenings for vestibular or other contributions to patients' dizziness were not screened for. It makes sense that "behavioral" training would help his patient population due to my experience with this group of patients and the high likelihood that some psychosocial aspects of their symptoms are most likely present.

Mazuquin BF, Wright AC, Russell S, Monga P, Selfe J, Richards J. Effectiveness of early compared with conservative rehabilitation for patients having rotator cuff repair surgery: an overview of systematic reviews. *Br J Sports Med*. 2016;0:1-11.

Review submitted by Nicolas Hoover

Purpose:
The purpose of this systematic review of systematic reviews was (1) to comprehensively review the available evidence for patients after surgical rotator cuff repair and (2) to assess the effectiveness of early mobilization for pain, functional status, range of motion, and retears.
Methods:
Systematic reviews and RCTs that compared the effectiveness of early rehabilitation with conservative rehabilitation after surgical RC repair, under supervision of therapists were included. Studies had to report at least one of: shoulder ROM, pain, functional scores, retear rates. Studies had to report clinically relevant follow-up period between 3-24 months. Only studies of chronic RC tears were considered.
Data Extraction: The data extracted and synthesised by two independent reviewers were: author names and publication years, design of the included primary studies, inclusion criteria for primary studies, group intervention and comparison of the primary studies, tools used for outcomes assessment, the results for the variables of interest (ie, ROM, functional scores and retears rate) and references of the primary studies.
The two reviewers scored each article using the Revised Assessment of Multiple Systematic Reviews (R-AMSTAR) tool.
Meta-analyses were performed for various outcomes including: American Shoulder and Elbow Surgeons (ASES) score, Constant-Murley (CM) score, Simple Shoulder Test (SST) score, VAS and ROM.
Results:
SRs:
1722 Systematic Reviews were screened, 13 total reviews were selected for final decision, 10 studies were included in this SR. The most reported tool was ASES questionnaire. Most reviews performed meta-analyses for ROM and retears ratio. Results were inconclusive about ROM, functionality and retear rates. 4 SRs found that early management was more favorable for ROM.
RCTs:
1722 RCTs were screened, 13 were selected for final decision and 11 RCTs were included in this SR. Mean age of participants in these 11 studies was 55.3-65.1. The majority of studies included medium sized tears, 5 studies included large tears. All studies used arthroscopic technique but included variable techniques including single row, double row, suture bridges. Some reported additional biceps procedures or capsule release. Post-operative orthoses were variable from standard sling to addition of bracing and abduction pillows. Variations were also noted in start time of rehab. Early rehab group ranged from post op day 1 to 5 weeks. Conservative rehab group ranged from post op day 1 to 9 weeks.
No significant differences were found for VAS pain at 6 and 24 months follow up. No significant differences were found for ASES score at 6, 12, and 24 months follow up. No significant differences were found for CM score at 6 and 12 months follow up. No significant differences were found for SST at 6 and 12 months follow up. No significant differences were found for ROM in shoulder flexion, ER, IR, Abduction. No significant differences were found for retear rate suggesting that early rehabilitation does not cause increased risk for retear.
Conclusion:
Early mobilization does not improve functional outcomes, pain or ROM when compared to conservative rehabilitation and it does not cause higher retear rates.

The result of pain must be interpreted carefully as information about additional therapies for pain management is lacking. Patient factors that comprise recovery must be considered.

Comments:

This article provides supportive information for clinical decision-making regarding post-op rehab for RC repairs. With variable suggestions and protocols from physicians, it is often difficult to be assured we are implementing the correct plan of care. Although the results are inconclusive in this systematic review, the results are valuable in that there is low risk for retear or reinjury with use of early rehabilitation and no significant difference in functional outcome with delayed/conservative rehabilitation. This information allows us to consider the individual patient characteristics and share the evidence that, regardless of the intervention plan recommended by their physician, the outcomes are favorable for successful recovery.

Boyd B, Nee R, Smoot B. Safety of lower extremity neurodynamic exercises in adults with diabetes mellitus: a feasibility study. J Man Manip Ther. 2017; 25(1): 30-38

Review submitted by: August Winter, PT, DPT

Objective: The purpose of this article was to investigate the safety of performing lower extremity neurodynamic exercises in patients with diabetes mellitus (DM), as well as any immediate improvements seen in straight leg raise (SLR) ROM following the intervention.

Methods: 20 study participants were recruited to attend one session consisting of five neurodynamic exercises. All exercises were completed on the right lower extremity, with the left acting as the comparison control. Participants were required to have DM type I or II, but were not required to have diabetic neuropathy symptoms. Subjects were excluded if they currently had neck or low back pain. Subjects completed three measures related to the severity of peripheral neuropathy: vibration perception threshold (VPT), Michigan Neuropathy Screening Instruments (MNSI) and the Michigan Diabetic Neuropathy Score (MDNS). Five neurodynamic exercises using a sliding technique were utilized, with the ordering of exercises chosen to progressively increase the loading of the neural structures. Exercises were performed for 30 seconds, with 1 repetition every 3-4 seconds, and 60 seconds of rest of each bout. Adverse events were defined as any exacerbation of neuropathic symptoms presents, or discomfort or pain. Stretching and tightness were not considered adverse events. SLR was assessed by measuring hip flexion using an inclinometer on the tibial tuberosity, with the ankle in a position of plantar flexion and dorsiflexion.

Results: MNSI scores revealed 70% of subjects with an abnormal score, MDNS scores demonstrated 20% of subjects had mild neuropathy and that 45% had moderate neuropathy. Per the VPT, 50% of subjects had an intermediate to high risk for the development of diabetic ulcers. The MDC for the SLR for this tester was calculated as 2 degrees. The only adverse event which occurred was a sensation of calf cramping during one of the exercises which resolved after 30 seconds of rest. During the fifth exercise set, 55% of subjects reported a stretching sensation in the posterior lower extremity which resolved immediately after moving out of that position. On the experimental side the PF SLR increased significantly by 5.2 degrees, and by 5.3 degrees in the DF SLR test. Only one participant had a decreased test, with a 3 degree decrease in the PF SLR. There were no significant changes in the location or quality of sensory responses during SLR testing for either limb when comparing pre and post intervention.

Conclusions: This is the first study to show that the performance of neurodynamic exercises with patients with DM can produce immediate detectable changes in SLR ROM and is not associated with the short term onset of adverse events.

Commentary: This article begins by framing its objective by pointing out that 21 million people in the United States are diagnosed with DM, and that frequently these patients presents to PT with musculoskeletal complaints. The article goes on to point out that ROM restrictions in these individuals may contribute to diabetic ulcers and other morbidity, and that ROM restriction may have to do with neural mechanical sensitivity in addition to joint restriction. While this line of thinking makes sense it is also well beyond the scope of this feasibility study. This article does add to a body of research about the safety of neural mobilizations. No adverse events were noted immediately, which gives us greater confidence in performing these interventions in this population. The article also demonstrates detectable and significant improvements in SLR motion in the mobilized lower extremity, although how important these improvements are clinically is not known. From previous work by Nee et al. it would have been preferable to see at least 24

hours follow up to see if there had been any incidence of latent adverse events. This study also excluded patients with low back pain, which in the study design is understandable, but also potentially changes the applicability of the intervention in clinic with a patient with radicular symptoms and DM. The study also took measures to address the presence of neuropathy in their subjects, but then presented no data on potential differences or lack of differences in SLR improvement between these groups. This may be due to the small number of subjects preventing accurate analysis of that type.

NDexer 1:

NDexer 2:

NDexer 3:

NDexer 4:

NDexer 5:

Karel YH, Verhagen AP, Thoomes-de graaf M, et al. Development of a Prognostic Model for Patients With Shoulder Complaints in Physical Therapist Practice. Phys Ther. 2016;

Review Submitted by: Scott Resetar, PT, DPT

Objective: To describe the clinical course of recovery of shoulder pain and identify prognostic factors of recovery in patients with shoulder pain at 26 week follow-up

Methods: Prospective cohort design with follow-up data collected at 6 weeks, 12 weeks, and 26 weeks. Patients presenting to a PT w/ shoulder pain were eligible if they were over 18 years old, understood duth well, did not have serious pathology (infection, cancer, fracture), had no surgery of the shoulder in the last 12 months, had no diagnostic imaging within 2 months prior to start of the study (diagnostic ultrasound, MRI, or X-ray). Variables measured inlcuded age, sex, level of education, employment status, and job desription (physically heavy work, static repetitive work, or work with awkward postures), duration of complaints, previous episodes of shoulder pain (yes/no), pain intensity at baseline, co-morbidities of elbow/wrist/hand/neck/back pain, sick leave due to shoulder (yes/no), increase of complaints during work (yes/no). Objective measures were the SPADI, Working alliance inventory, a quality of life measure, and GROC.

Results: N=272 that completed final 26 week follow-up. No difference in baseline characteristics between patients who finished or dropped out of the study. At 6 weeks, 41% were recovered. 57% were recovered after 12 weeks, and 60% were recovered after 26 weeks. Recovery rates were significantly higher in the working population (46%, 60%, and 65% respectively). After a backwards Wald regression was completed, a model arose that correctly classified 65% of all patients, and 69% of all working patients into their correct group (recovered/not recovered). The variables that were included were duration of complaints, SPADI score, paid work (yes/no), anxiety/depression, and working alliance. A shorter duration of complaints, lowere SPADI score, having a job, not having anxiety/depression, and having a positive working alliance were all associated with greater chance of recovery

Conclusions: Previous studies have shown that age, sex, repetitive movements, and presence of co-morbidities were all prognostic factors for recovery, but none of these factors made it into the final model, although there is an argument to be made that they defined co-morbidities differently than in previous research. Although the receiver operating curve characteristics showed a statistically significant ability to discriminate between the two groups, the overall result would be classified as "poor ability to discriminate". i.e. This isn't a great model.

Commentary: Previous studies showed that between 21% and 51% of people with shoulder pain recover in 6 months, so this study's results of 60% recovery are a bit higher. The final results are not surprising considering the recent influx of data that psychosocial factors (alliance, depression/anxiety, work status) can be significant prognostic factors. The fact that this model can give you a 65% chance of predicting that a patient will recover is not that much better than a coin flip. In addition, there are no cutoff scores for duration of symptoms, SPADI, or the working alliance measure. It would be more useful if the model said: if duration of symptoms less than 6 weeks, SPADI <= 40%, Working alliance inventory > 4. But we just know the general direction of these associations which makes this model less useful.

Ho K-Y, Epstein R, Garcia R, Riley N, Lee S-P. Effects of Patellofemoral taping on Patellofemoral joint alignment and contact area during weight bearing. J Orthop Sports Phys Ther. 2017;47(2):115–123. doi:10.2519/jospt.2017.6336.

Review submitted by: Katie Stokely, PT, DPT

Objective: The McConnell tapping technique is a commonly utilized and studied intervention for patellofemoral pain (PFP). Studies show that PFP is related to increased patellofemoral joint (PFJ) stress, the exact cause of which is multifactorial in nature. This includes altered joint reaction forces, decreased joint contract, and muscular imbalances. Previous studies have shown McConnell tapping to be useful in decreasing patellofemoral symptoms and increasing quadriceps activation and biomechanics by addressing patellar malalignment. More recently, the Kinesio taping method has gained popularity as a technique to address PFP as well. The purpose of this study was to examine the effects of both McConnell and Kinesio tapping techniques on PFJ alignment in three weight bearing positions. The secondary goal of this study was to determine the effects of these tapping methods on PFP. Researchers hypothesized that both taping methods would increase PFJ contact area which would reduce PFP symptoms.

Methods: Fourteen female participants with symptoms of retropatellar pain were chosen for this study. Inclusionary criteria included those with PFP who underwent examination to rule out affiliated pain locations, positive compression test, and at least one sign of patellar malalignment (Q-angle $\geq 15^{\circ}$, patellar lateral hypermobility, and/or positive J-sign). Exclusionary criteria included those with a history of knee surgery, patellar dislocation, or metal implants impeding them from undergoing MR imaging. Tapping techniques aimed to correct patellar lateral displacement as they were likely to experience this during quadriceps activation. Pain and PFJ contact area were measured prior to tapping and immediately after both tapping techniques. Pain was rated via the numeric rating scale when performing a 30 cm step down with the uninvolved limb. MR imaging was performed prior to tapping and following each tapping technique when participants were loaded with 25% of their body weight at 0°, 20°, and 40° of knee flexion. Patellar lateral displacement, mediolateral tilt, height, and contact area was recorded.

Results: Data did not show significant support for the use of McConnell or Kinesio tapping in order to alter PFJ alignment and contact area. There was no significant main effect on patellar lateral displacement, patellar mediolateral tilt, patellar height and contact area. Angle of knee flexion did significantly affect patellar lateral displacement between 0° and 20° and 0° and 40°. Contact area of the patella significantly increased from 0° to 40° of knee flexion. Following Kinesio tapping there was a statistically significant reduction in pain level.

Conclusion: McConnell and Kinesio tapping were not found to mechanically change the alignment or contract area of the PFJ in weight bearing conditions in female subjects with PFP.

Commentary: I chose this article because I have found the application of the various types of athletic tape to be a topic of some debate, such as in the reliance of individuals utilizing taping applications, such as McConnell and Kinesio, to provide relief from PFP symptoms. The results of this study showing that McConnell and Kinesio taping do not improve PFJ alignment and contract area illustrates the application of taping is not a universal solution to PFP. Studies such as this one show tapping may have its place in practice as long as its intended use and desired results are understood. It's important to complete a thorough dynamic and static examination of patellar mobility as well as addressing proximal, local and distal symptoms. Taping can be a tool in the tool box, but not something every patient may benefit from.