

36

OUTCOME PREDICTORS FOR RECOVERY OF PATELLAR TENDINOPATHY IN JUMPING ATHLETES: AN INTERNATIONAL PROSPECTIVE COHORT STUDY

¹Abdulhamit Tayfur*, ²Dominik Zenner, ¹Stuart Charles Miller, ³Hazel Screen, ¹Dylan Morrissey. ¹Sports and Exercise Medicine, William Harvey Research Institute, Barts and the London School of Medicine and Dentistry, Queen Mary University of London, UK; ²Institute of Population Health Sciences, Barts and the London School of Medicine and Dentistry, Queen Mary University of London; ³School of Engineering and Materials Science, Queen Mary University of London

10.1136/bmjsem-2022-sportskongres.9

Introduction Patellar tendinopathy (PT) has poor outcomes, and we have no robust prognostic guides to understand who gets better, when and why. We aimed to identify which combination of self-reported factors best predicts PT recovery.

Materials and Methods A previously validated, reliable online questionnaire battery yielded data from an international sample of elite and non-elite jumping athletes with a one-year follow-up. Recovery was defined by availability status for training and competition. More than 100 bio-psycho-social, demographic and sports specific factors were collected and a multivariable cox proportional-hazards model constructed.

Results 128 athletes with PT (30.9±8.9 years; 77 males; VISA-P=61.5±16.2) provided 25,284 days at risk (198±141 days) for analysis. Recovery rate was 45% occurring around 6-month. The final multivariable model partially predicted PT recovery with acceptable model performance and internal validation (optimism-corrected Harrell's C discrimination=0.77 and Calibration Slope=0.86). The model showed that PT recovery is associated with a higher KOOS-PF score (lower severity; HR=1.03, 95%CI=1.02–1.05), a shorter time-off from sport (HR=0.93, 95%CI=0.87–0.99), feeling more rested after sleep (HR=1.93, 95%CI=1.13–3.28), not having concurrent tendon problems (HR=0.23, 95%CI=0.07–0.69), higher training duration (HR=1.05, 95%CI=1.01–1.10) and symptoms that can be modified by movement (HR=2.71, 95%CI=1.21–6.09).

Conclusion This is the first study investigating outcome predictors for PT recovery. The developmental statistical causal model showed that sports specific and biomedical variables partially predicted PT recovery. Demographic or psychosocial variables did not contribute to the model. These findings could enhance professionals' understanding of PT prognosis and clinical decision making.

37

WEEKLY ADDUCTOR SQUEEZE STRENGTH MONITORING IN MALE ACADEMY FOOTBALL PLAYERS: IS IT INFLUENCED BY GROIN PAIN ONSET?

¹Matthew DeLang*, ²James Craig Garrison, ³Joseph P Hannon, ⁴Lasse Ishoi, ⁴Kristian Thorborg. ¹Right to Dream, Right to Dream Academy, Ghana; ²Northwestern University, USA; ³St. Louis Children's Hospital: Young Athlete Center, USA; ⁴Sports Orthopaedic Research Center – Copenhagen, Hvidovre Hospital, Kettegård Allé 30, Denmark

10.1136/bmjsem-2022-sportskongres.10

Introduction Groin monitoring systems are a secondary prevention tool in youth football. Symptom screenings can be supported by objective findings, such as hip adduction squeeze strength. This study examined how groin pain influenced weekly squeeze strength in youth academy football players over a 14-week period.

Materials and Methods Weekly monitoring of youth football players consisted of groin symptom check-ins and long lever squeeze strength. Players who reported groin pain were stratified into the groin pain group while players who did not report pain remained in the no groin pain group. Baseline squeeze strength was retrospectively compared between the groups. Players with groin pain were examined via repeated measures ANOVA at four timepoints: baseline, one-week-prior to pain onset, pain onset, and return to pain-free.

Results 53 players were included (age 14.4±1.6 years). Baseline squeeze strength was not different between players in the groin pain (n=29, 4.35±0.89 N/kg) versus no groin pain group (n=24, 4.33±0.90 N/kg, p=0.83). Players with no groin pain maintained similar squeeze strength throughout 14 weeks (p>0.05). Compared to baseline (4.33±0.90 N/kg), players with groin pain had decreased squeeze strength at one-week-prior to pain onset (3.91±0.85 N/kg, p=0.003) and at pain onset (3.58±0.78 N/kg, p<0.001), but squeeze strength when pain subsided (4.06±0.95 N/kg) was not different than baseline (p=0.14).

Conclusion Decreases in groin squeeze strength exist in players with groin pain onset, and even manifest one-week prior to groin pain onset, compared to players without groin pain. Weekly squeeze strength may be an early marker for groin pain.

48

USABILITY TESTING OF A MUSCULOSKELETAL DIGITAL ASSESSMENT ROUTING TOOL: AN ITERATIVE CONVERGENT MIXED METHODS STUDY

¹Cabella Lowe*, ¹Mitchell Browne, ²William Marsh, ¹Dylan Morrissey. ¹Sports and Exercise Medicine, William Harvey Research Institute, Barts and the London School of Medicine and Dentistry, Queen Mary University of London, Mile End Hospital, E1 4DG, UK; ²Risk and Information Systems Research Group, School of Electronic Engineering and Computer Science, Queen Mary University of London, 2 Newark Street, E1 2AT, UK

10.1136/bmjsem-2022-sportskongres.11

Introduction Digital technologies improving clinical outcomes and efficiency are prioritized for development. We have developed a musculoskeletal Digital Assessment Routing Tool (DART) directing users to right care, first time. DART requires usability testing prior to clinical trials.

Materials and Methods An iterative-convergent mixed-methods design was used to assess and mitigate DART usability issues. 22 participants used 50 musculoskeletal presentations across 4 DART iterations during 5 testing rounds. Recruitment quotas for age, habitual internet use and English language ability were used. Constructs of the ISO 9241-210-2019 standard defined quantitative data collection, with user satisfaction measured by the system usability scale. Study endpoints were mitigation of significant usability problems and a mean satisfaction score of 80+ across a minimum of 3 testing rounds.

Results All test assessments gave a recommendation with no system errors. Usability problems reduced from 12 to zero. Mean assessment time was 5 minutes (range 1–18), 6 minutes for non-native English speakers. Differences in satisfaction scores were present between groups, expert internet users having the highest mean score (86.5, SD 4.48, CI 90% 1.78), compared with non-native English speakers (78.1, SD 4.60, CI 90% 9.17) and less experienced internet users scoring the lowest (70.8, SD 5.44, CI 90% 3.79). The mean score across all groups was 84.3 (84.3, SD 12.73, CI 90% 4.67), with

qualitative data from all participants confirming DART was simple to use.

Conclusion With all significant usability problems addressed DART can proceed to a randomized controlled trial assessing safety and effectiveness against a usual care comparator.

56

SELECTIVE HEAD-AND-NECK COOLING ACUTELY FOLLOWING SPORTS-RELATED CONCUSSION REDUCES TIME FROM PLAY IN SWEDISH ELITE ICE HOCKEY PLAYERS

¹Niklas Marklund*, ¹Ali Al-Husseini, ¹Anna Gard, ²Erik Andersson, ³Yelverton Tegner. ¹Lund University, Department of Clinical Sciences, Neurosurgery, Klinikgatan 17A, Sweden; ²Polar Cool Inc., Medicon Villages, Sweden; ³Department of Health Sciences, Luleå Tekniska Universitet, Sweden

10.1136/bmjsem-2022-sportskongres.12

Introduction Sports-related concussions (SRCs) are an increasingly recognized health problems and treatment options are scarce. We tested the hypothesis that immediate selective head-neck cooling shortens return-to-play (RTP) in concussed ice hockey players.

Material and Methods Over 5 seasons, 19 professional ice hockey teams were divided into 2 groups – intervention teams, where concussed players received selective head-neck cooling, and control teams using standard SRC management. Concussion was diagnosed by established criteria. A head-and-neck cooling cap- system, designed to reduce the brain temperature with a cold circulating coolant, was used. The cooling started acutely after SRC diagnosis and was used for ≥ 45 min. All players were subjected to a standardized graduated RTP protocol. Before RTP, SCAT baseline level and medical teams' clearance should be reached. The main outcome measure was time until completing the graduated rehabilitation program and RTP.

Results In the teams using cooling, 62 concussions were recorded, and 75 in the control teams. Median time to initiate cooling was 11 (range 5–30) minutes. The median time to RTP was 9 days in the cooling group, in controls 12 days ($p < 0.00001$; 95% CI: -7.0; -1.99). In players receiving selective head-neck cooling, 94% (58/62) had an RTP ≤ 3 weeks and 100% had an RTP ≤ 56 days. In controls, 71% (53/75) had an RTP ≤ 3 weeks and 87% ≤ 56 days ($p < 0.001$).

Conclusions Acute selective head- and neck cooling shortens RTP and reduces the risk of long-term absence from play in concussed ice hockey players.

63

NUMEROUS TREATMENTS ARE EFFICACIOUS FOR PATELLOFEMORAL PAIN: A SYSTEMATIC REVIEW AND META-ANALYSIS

^{1,2}Bradley Neal*, ²Clare Bartholomew, ⁵Christian Barton, ^{2,4}Dylan Morrissey, ^{2,3}Simon Lack. ¹School of Sport, Rehabilitation and Exercise Sciences, University Of Essex, Wivenhoe Park, UK; ²Sports and Exercise Medicine, William Harvey Research Institute, Barts and the London School of Medicine and Dentistry, Queen Mary University London, Mile End Hospital, Bancroft Road, UK; ³Pure Sports Medicine, Point West Building, 116 Cromwell Road, UK; ⁴Physiotherapy Department, Barts Health NHS Trust, Mile End Hospital, Bancroft Road, UK; ⁵La Trobe Sport and Exercise Medicine Research Centre, School of Allied Health, Human Services and Sport, La Trobe University, Bundoora, 3086, Australia

10.1136/bmjsem-2022-sportskongres.13

Introduction Patellofemoral pain (PFP) is common and impacts health-related quality of life. Despite numerous published guidelines, understanding of intervention efficacy is limited.

Materials and Methods We registered with PROSPERO (CRD42019152252) and searched multiple databases to April 2021 and included only high-quality randomised controlled trials (RCTs) scoring >7 on the PEDro scale. We pooled methodologically homogenous pain (e.g., numerical rating scale) and function (e.g., kujala scale) data using random effects models at short-, medium- and long-term (<3 , >3 - <12 , >12 months respectively). Interventions demonstrated primary efficacy if there was a significant comparison with sham, placebo, or wait-and-see control in an adequately powered RCT ($n > 23$) or data pooling. Secondary efficacy or superiority was determined by a significant comparison to an intervention with primary efficacy. The GRADE criteria determined evidence certainty (very low to high).

Results We identified 61 high-quality RCTs involving 3,543 participants. Four interventions demonstrated primary efficacy for short-term pain and function: knee-targeted exercise (high/moderate), multi-modal physiotherapy (low/low), foot orthoses (low/absent), and lower-quadrant manual therapy (absent/moderate). Hip- and knee-targeted exercise demonstrated secondary efficacy for pain and function in the short (low/moderate), medium (moderate/moderate), and long-term (moderate/moderate). Knee-targeted exercise combined with perineural dextrose injection demonstrated secondary efficacy in the short-term (moderate/moderate). Multi-modal physiotherapy demonstrated superiority for pain and function in the short-term (very low/very low) compared to knee-targeted exercise alone.

Conclusions Wait-and-see, sham, or placebo should not be used for PFP, as several interventions have proven efficacy. Future effectiveness studies should include long-term follow-up. Our synthesis will inform a future updated best practice guide.

69

SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS AND COHORT STUDIES OF RISK FACTORS FOR KNEE OSTEOARTHRITIS AFTER TRAUMA (OPTIKNEE)

¹Jackie L Whittaker*, ¹Justin Losciale, ³Carsten Juhl, ³Jonas Thorlund, ³Matilde Lundberg, ¹Linda Truong, ⁴Maxi Miciak, ⁵Belle van Meer, ⁶Adam Culvenor, ⁶Kay Crossley, ³Ewa Roos, ⁷L Stefan Lohmander, ⁵Marienke van Middelkoop. ¹University of British Columbia, Department of Physical Therapy, 2177 Wesbrook Mall, Canada; ²Arthritis Research Canada, 2238 Yukon Street, Canada; ³University of Southern Denmark, Denmark; ⁴University of Alberta, Faculty of Rehabilitation, Canada; ⁵Erasmus MC Medical University Center, Netherlands; ⁶La Trobe University, Australia; ⁷Lund University, Sweden

10.1136/bmjsem-2022-sportskongres.14

Introduction It is unclear why some people develop osteoarthritis after knee trauma and others don't. This study identified risk factors for osteoarthritis following knee trauma.

Materials and Methods After protocol registration, 5 databases were searched to 09–2021. RCTs and cohort studies assessing risk factors for symptomatic or structural osteoarthritis in persons with knee trauma, mean injury age ≤ 30 -years, and minimum 2-year follow-up were included. Record screening, data extraction and risk-of-bias assessment was duplicated (blinded). Meta-analyses (random effects models) estimated the odds of osteoarthritis for risk factors assessed in ≥ 4 studies. Remaining