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In a small case series of anterior cruciate ligament (ACL) tears in skeletally immature subjects (mean age 13.9 years), early primary repair of the ACL appears to yield the best results on follow-up (after 5 years)

Title: The functional outcome of total tears of the anterior cruciate ligament (ACL) in the skeletally immature patient

Authors: Arbes S, Resinger C, Veesei V, Nau T

Reference: Int Orthop 2007; 31: 471-475

Type of study: Case series

Keywords: knee, injury, adolescent, skeletally immature, ACL, surgery

EB Rating: 5.5/10

CI Rating: 7.5/10

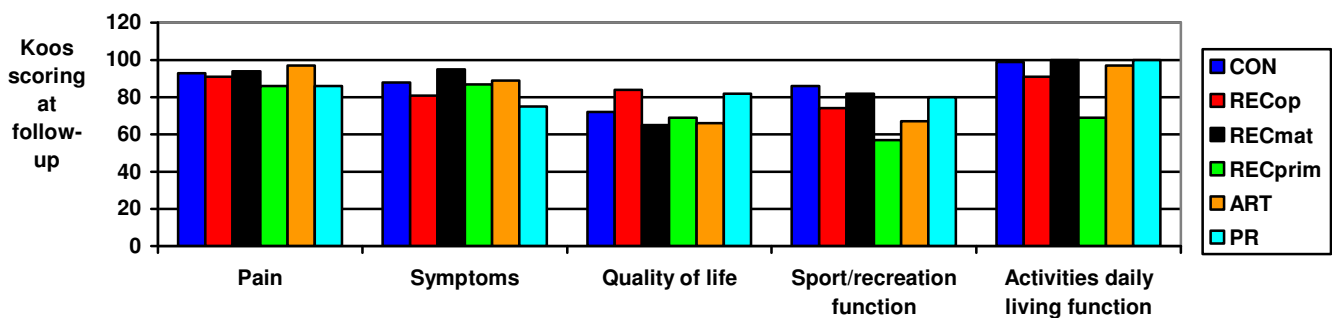
Background: The management of acute tears of the anterior cruciate ligament (ACL) in the skeletally immature patient is controversial, and there are few longer term follow-up studies

Research question/s: What is the functional outcome following different treatment techniques in young skeletally immature patients with total tears of the anterior cruciate ligament (ACL)?

Methodology:

- Subjects: 20 subjects (skeletally immature with mean age at time of injury=13.9, range 9-15 yrs, boys=7, girls=13) who had rupture of the anterior cruciate ligament
- Experimental procedure: The subjects underwent treatment using 6 different techniques: Conservative (C=8 physio and bracing), ACL reconstruction with patella tendon, wide-open physis (RECop=4), ACL reconstruction after skeletal maturity (RECmat=3), ACL reconstruction after failed primary repair (ACLprim=2), arthroscopic debridement of ACL stumps (ART=2), and primary repair (PR=1). All the subjects were followed up for a mean of 5.4 years, and assessed clinically [International Knee Documentation Committee Scoring System (IKDC), Knee Injury and Osteoarthritis Outcome Scoring System (KOOS)], radiologically (Jaeger and Wirth's criteria), for stability (laxity testing - Rolimeter)
- Measures of outcome: Clinical, radiological and laxity test results at follow-up in the 6 groups

Main finding/s:



- In general subjects in the CON, RECprim, RECmat, ART and PR groups had poor function of the knee
- Subjects in the RECop (early reconstruction) appeared to have the best results at follow-up, with all 4 subjects returning to pre-injury sports participation

Conclusion/s:

- In a small case series of anterior cruciate ligament (ACL) tears in skeletally immature subjects (mean age 13.9 years), early primary repair of the ACL appears to yield the best results on follow-up (after 5 years)

Methodological considerations:

Case series, descriptive data, small sample size

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In a prospective cohort study among military recruits, intrinsic biomechanical risk factors for patellofemoral pain syndrome (PFPS) were 1) a less pronated position at heel strike and 2) rolling over more on the lateral side of the foot during the contact phase of walking

Title: A prospective study on gait-related intrinsic risk factors for patellofemoral pain

Authors: Thijs Y, Van Tiggelen D, Roosen P, De Clercq D, Witvrouw E

Reference: Clin J Sport Med 2007; 17(6): 437-445

Type of study: Prospective cohort study

Keywords: knee, Patellofemoral pain syndrome (PFPS), anterior knee pain, biomechanics, plantar pressure

EB Rating: 8/10

CI Rating: 8/10

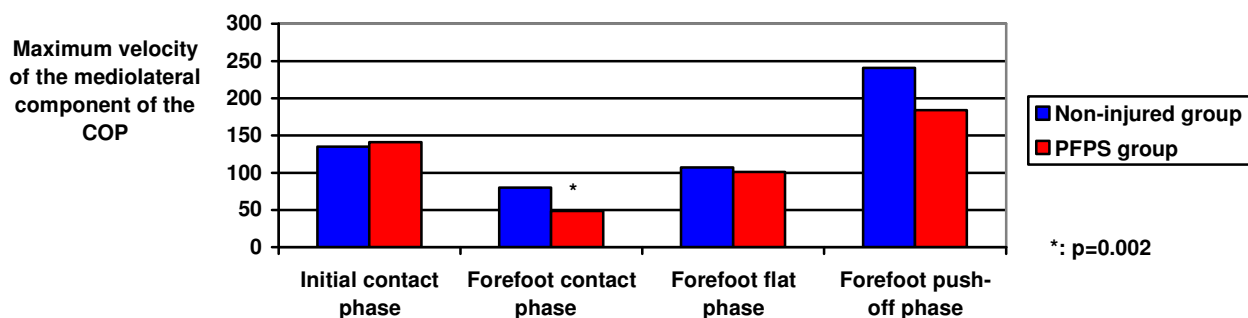
Background: Patellofemoral Pain Syndrome (PFPS) is a common overuse injury of the knee in athletes and those engaged in physical activity – intrinsic biomechanical risk factors associated with PFPS have not been fully studied
Research question/s: To prospectively determine gait-related risk factors for patellofemoral pain?

Methodology:

- Subjects: 84 military recruits of the (male=65, female=19) with no history of knee or lower leg pain Belgian Royal Military Academy during a 6-week basic military training period. Eighty-four officer cadets, who entered the Military Academy and were without a history of any knee or lower-leg complaints, participated in the study
- Experimental procedure: All the subjects underwent an assessment, including a biomechanical assessment (measurement of plantar pressure measurements during walking using a “footscan” pressure plate - RsScan International). Subjects then underwent 6-weeks basic military training period and all patellofemoral pain injuries were documented (diagnosed by a sports medicine physician).
- Measures of outcome: Incidence of PFPS (%), plantar pressure measurements (at heel strike, during stance phase) (temporal data, peak pressure data, medio-lateral pressure distribution in the foot, displacements of center of pressure – COP)

Main finding/s:

- Incidence of PFPS: the 6 week incidence of PFPS in the group was 36/84 (43%)



- Intrinsic biomechanical risk factors for PFPS (logistic regression analysis): 1) more laterally directed pressure distribution at initial contact of the foot, 2) shorter time to maximal pressure on the fourth metatarsal, and 3) slower maximal velocity of the change in the latero-medial direction of the COP during forefoot contact

Conclusion/s:

- In a prospective cohort study among military recruits, intrinsic biomechanical risk factors for patellofemoral pain syndrome (PFPS) were 1) a less pronated position at heel strike and 2) rolling over more on the lateral side of the foot during the contact phase of walking

Methodological considerations:

Well-conducted prospective study

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A single static stretch session (3X30 sec) significantly improved the accuracy of knee joint position sense (with the knee in 45° of flexion)

Title: Effect of static stretching of muscles surrounding the knee on knee joint position sense

Authors: Ghaffarinejad F, Taghizadeh S, Mohammadi F

Reference: Br J Sports Med 2007; 41: 684-687

Type of study: Randomized, controlled, clinical trial

Keywords: stretching, static stretch, knee, position sense, proprioception

EB Rating: 7.5/10

CI Rating: 7/10

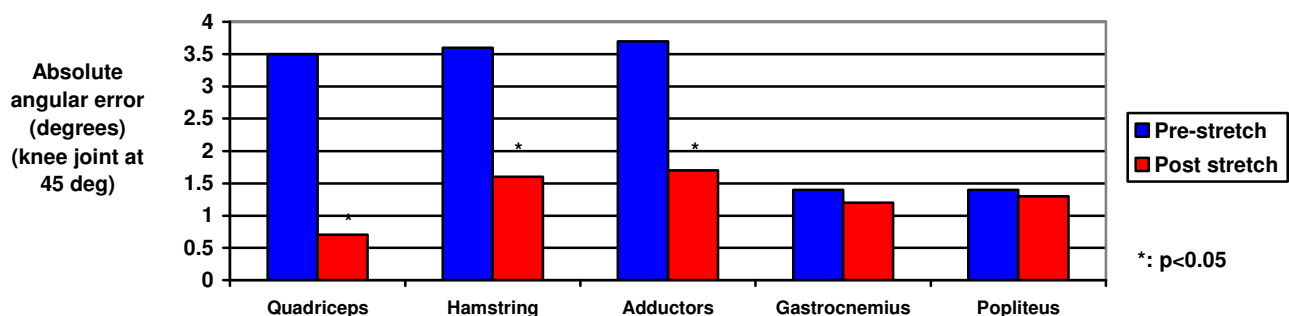
Background: Static stretching is a common technique that is used by athletes in training and rehabilitation following injury – the effects of static stretching on proprioception (joint position sense) has not been studied

Research question/s: Does a single static stretch session (3 stretches of 30 sec) affect proprioception (knee joint position sense)?

Methodology:

- Subjects: 39 students (female=21, male=18) (healthy, non-injured)
- Experimental procedure: All the subjects were assessed and then underwent testing before and immediately after static stretching (3X30 sec stretches) for the quadriceps, hamstring, adductors, gastrocnemius, and popliteus muscles. The ability to reproduce the position of the knee joint at two angles (20° and 45° of flexion) was measured as the absolute angular error (AAE - the absolute difference between the target angle and the subject perceived angle of knee flexion).
- Measures of outcome: Absolute angular error (AAE) pre and post stretch

Main finding/s:



- Stretching significantly decreases the knee joint AAE after stretching of the quadriceps, hamstring, and adductor muscles with the knee in 45° of flexion
- There were no differences in the AEE after stretching the gastrocnemius and popliteus muscles with the knee in 45° of flexion and in all the muscles with the knee in 20° flexion

Conclusion/s:

- A single static stretch session (3X30 sec) significantly improved the accuracy of knee joint position sense (with the knee in 45° of flexion)

Methodological considerations:

Well-conducted study

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Marathon runners who consume excessive fluid during a race, and fail to lose > 0.75 kg during the race, are at a 7 times greater risk to develop hyponatremia during the race

Title: Risk factors for exercise-associated hyponatremia in non-elite marathon runners

Authors: Chorley J, Cianca J, Divine J

Reference: Clin J Sport Med 2007; 17: 471-477

Type of study: Prospective cohort (multiple) study

Keywords: sodium, hyponatremia, fluid, marathon, running, sweat rate

EB Rating: 7/10

CI Rating: 7.5/10

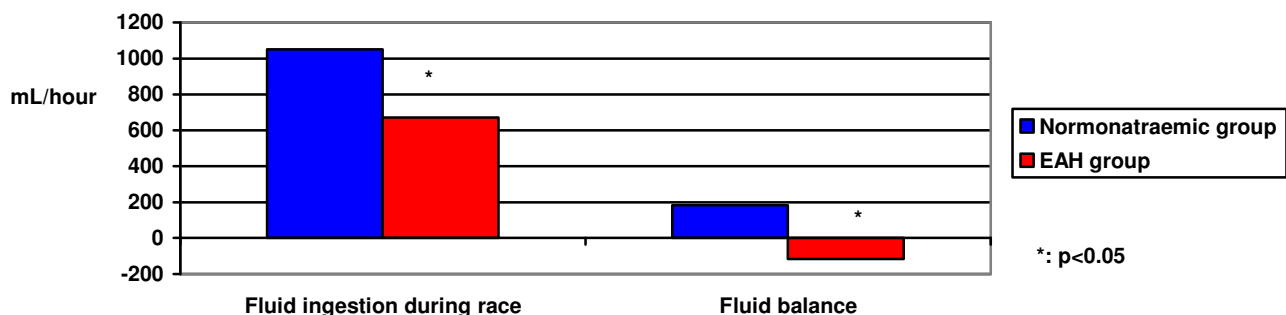
Background: Hyponatremia is a potentially fatal medical condition that can occur as a result of endurance sports – the risk factors for this condition need to be identified

Research question/s: What are the risk factors for lower post-race $[Na^+]$ and exercise-associated hyponatremia (EAH) (serum $[Na^+] < 135$ mmol/L) during marathon running?

Methodology:

- Subjects: 96 marathon runners (43+10 yrs, males=43) from 4 marathons
- Experimental procedure: All the subjects were assessed before the race (questionnaire, informed about recalling fluid consumption during the race, body weight, blood sample analysis). During the race weather conditions were recorded, and runners were asked to remember fluid intake. Post race body weight and blood sample analysis was conducted. Sweat loss was estimated (fluid consumed-body weight change). Runners were divided into those with normonatremia (normal serum sodium) and a hyponatremic group (serum $[Na^+] < 135$ mmol/L) (EAH=22%)
- Measures of outcome: Risk factors for EAH

Main finding/s:



- A lower post-race serum sodium and larger decreases in serum sodium were related to lower pre-race sodium concentration, less weight loss during the race, and more fluid cups consumed
- The most important risk factor for the development of post-race hyponatremia was losing < 0.75 kg body weight during the race, increasing the risk of EAH 7 fold (RR = 7.0; CI 1.8 to 26.6)

Conclusion/s:

- Marathon runners who consume excessive fluid during a race, and fail to lose > 0.75 kg during the race, are at a 7 times greater risk to develop hyponatremia during the race

Methodological considerations:

Well conducted study

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About 20% of college athletes report symptoms of depression, and factors associated with depression are: female gender, being a freshman, and a past history of clinical depression

Title: Prevalence of and risk factors associated with symptoms of depression in competitive collegiate student athletes

Authors: Yang J, Peek-Asa C, Corlette JD, Cheng G, Foster DT, Albright J

Reference: Clin J Sport Med 2007; 17(6): 481-487

Type of study: Descriptive cross sectional study

Keywords: athletes, depression, anxiety, prevalence

EB Rating: 6.5/10

CI Rating: 7/10

Background: There is a lack of scientific data on the mental health (including symptoms of depression) in athletes

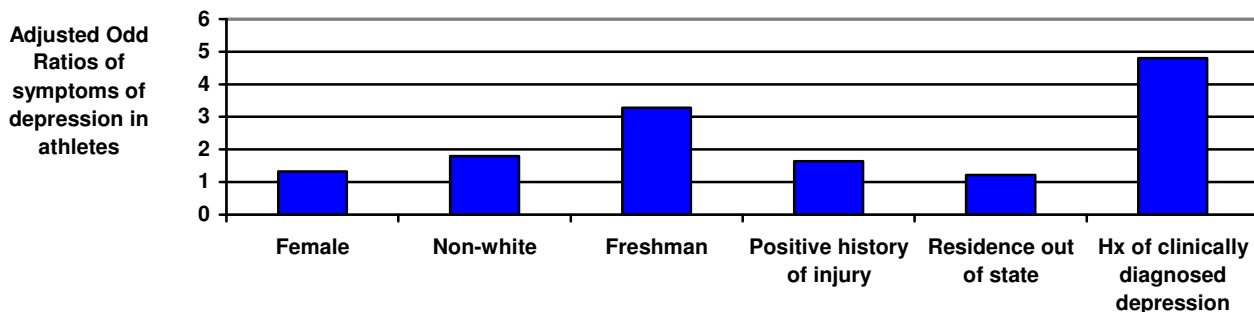
Research question/s: What is the prevalence of symptoms of depression among competitive collegiate student athletes and what factors are associated with symptoms of depression in this group?

Methodology:

- Subjects: 257 student athletes (male=167, female=90, 20±1.3 yrs)
- Experimental procedure: A survey was administered during preseason team meetings of the participating athletes. Demographic variables were measured, as well as symptoms of depression (center for Epidemiological Studies Depression Scale - CESD), anxiety (State-Trait Anxiety Inventory – STAI), and factors associated with symptoms of depression were determined (Generalized Estimating Equations - GEE)
- Measures of outcome: Prevalence of symptoms of depression (%), factor associated with symptoms of depression

Main finding/s:

- Prevalence of symptoms of depression: 21%



- Symptoms of depression in athletes were associated with higher scores of State-Anxiety and Trait-Anxiety, respectively ($p < 0.0001$)

Conclusion/s:

- About 20% of college athletes report symptoms of depression, and factors associated with depression are: female gender, being a freshman, and a past history of clinical depression

Methodological considerations:

Methods of assessing depression are not diagnostic, cause-effect relationships could not be determined, comparison to other studies is difficult

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