

SportsMed Update

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In high school soccer, injury rates are about 2.4 injuries per 1000 athletic exposures in males and females with higher rates occurring in competitions – the ankle and knee are the most common sites of injury

Title: The epidemiology of United States High School soccer injuries, 2005-2007

Authors: Yard EE, Schroeder MJ, fields SK, Collins CL, Comstock RD

Reference: Am J Sports Med 2008; 36(10): 1930-1937

Type of study: Prospective cohort study

Keywords: soccer, injury, epidemiology, high school, gender

EB Rating: 7.5/10

CI Rating: 7.5/10

Background: The number of children participating in high school soccer has increased dramatically in the last 5 years, resulting in potentially, an increased risk of injury

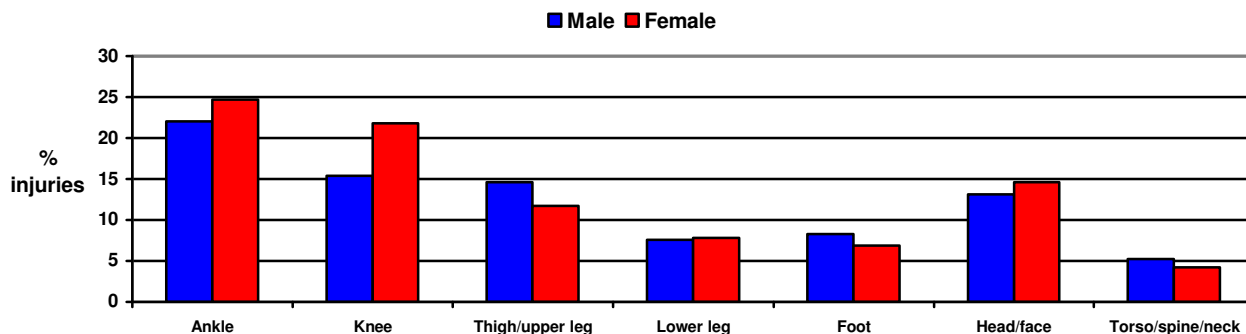
Research question/s: What is the pattern of injuries in children playing soccer at high school level?

Methodology:

- Subjects: Soccer players (male and female) from 100 nationally representative United States high schools
- Experimental procedure: Athletic trainers at participating high schools used an Internet-based sports-related injury surveillance system (Reporting Information Online - RIO) on a weekly basis to record injury (defined as 1 or more time loss days from play) data for two seasons from soccer players in the schools.
- Measures of outcome: Incidence of injury (per athletic exposures - AE), frequency of diagnoses (%), body sites injured (%), mechanism of injury

Main finding/s:

- Injury rates (per 1000 AE): Overall (all=2.39, male=2.34, female=2.44), Competition (all=4.77, male=4.26, female=5.34), Practice (all=1.37, male=1.51, female=1.21)



- Gender differences: Females sustained more complete knee ligament sprains requiring surgery during competition (per 1000 AE: female competition=26.4, male competition=1.98, female practice=2.34)
- Mechanism of injury: Extrinsic (player-to-player contact) was more common in competitions and intrinsic (non-contact) injury was more common in practices

Conclusion/s:

- In high school soccer, injury rates are about 2.4 injuries per 1000 athletic exposures in males and females with higher rates occurring in competitions – the ankle and knee are the most common sites of injury

Methodological considerations:

Well conducted large and detailed study

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In a pilot study (case series), patients with chronic insertional Achilles tendinopathy who were treated using a novel painful eccentric calf-muscle training protocol (not loading the ankle into dorsiflexion) showed better clinical results than previously reported

Title: New regimen for eccentric calf-muscle training in patients with chronic insertional Achilles tendinopathy: results of a pilot study

Authors: Jonsson P, Alfredson H, Sunding K, Fahlstrom M, Cook J

Reference: Br J Sports Med 2008; 42: 746-749

Type of study: Case series

Keywords: Achilles tendon, insertion, tendinopathy, eccentric loading, pain

EB Rating: 5.5/10

CI Rating: 7.5/10

Background: Eccentric training is a commonly used and successful treatment modality for mid-portion Achilles tendinosis, but has not been evaluated well in the treatment of insertional Achilles tendinopathy

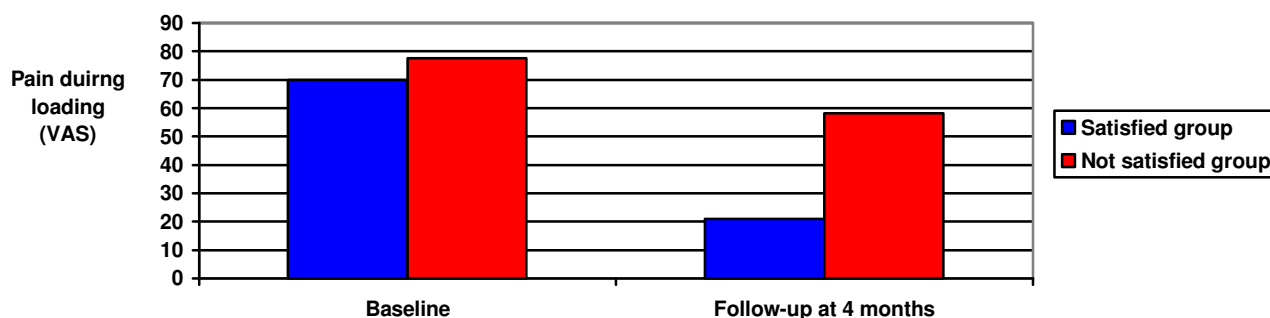
Research question/s: Does a novel treatment model of painful eccentric training improve pain and patient satisfaction in patients with chronic painful insertional Achilles tendinopathy?

Methodology:

- Subjects: 27 patients (male=12, 53.4±13 yrs) with 34 painful insertional Achilles tendinopathy (26.5±21.1 months)
- Experimental procedure: All the subjects were assessed and then underwent 12 weeks of treatment (2X per day, every day of the week) using a novel technique of performing painful eccentric training (15 repetitions, 3 times) (not loading into ankle dorsiflexion). Pain during tendon loading was determined before and after the 12 weeks using a VAS. Patients were classified as those that went back to tendon loading activity (satisfied with treatment – SAT) and those that did not (not satisfied – NOT)
- Measures of outcome: % satisfied patients, pain (VAS)

Main finding/s:

- % Patient satisfaction: Following treatment, 67% (23/34 tendons) of patients were satisfied and could go back to their previous tendon-loading activity



- Factors not distinguishing SAT from the NOT group were: age, height, body weight, gender, symptom duration, presence of Haglund's deformity, bursitis or bone spur

Conclusion/s:

- In a pilot study (case series), patients with chronic insertional Achilles tendinopathy who were treated using a novel painful eccentric calf-muscle training protocol (not loading the ankle into dorsiflexion) showed better clinical results than previously reported

Methodological considerations:

Case series, no control group

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In female field hockey players there is a high number of serious or potentially serious injuries to the head and face – greater use of protective equipment may be indicated to reduce injuries

Title: Injuries to the head and face in women's collegiate field hockey

Authors: Hendrickson CD, Hill K, Carpenter JE

Reference: Clin J Sport Med 2008; 18(5): 399-402

Type of study: Prospective cohort study

Keywords: injury, field hockey, head injury, face injury, females

EB Rating: 6.5/10

CI Rating: 7/10

Background: Injury patterns in field hockey have not been well documented – in particular, the pattern of injuries to the head and face

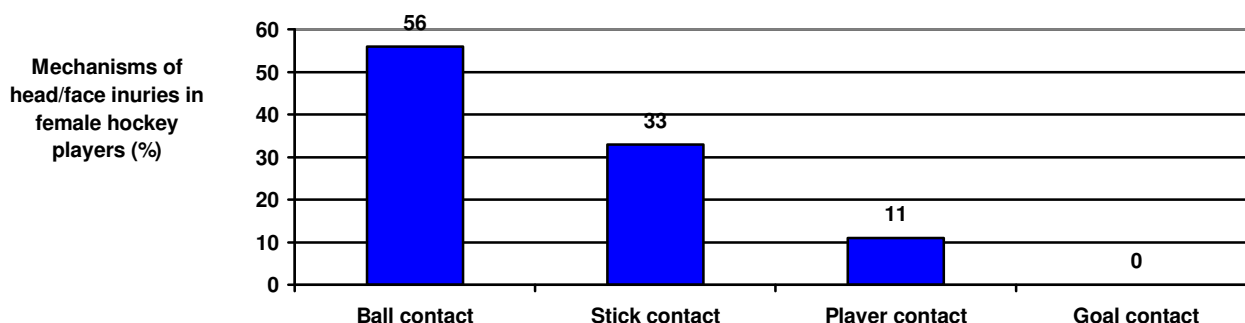
Research question/s: What is the incidence and severity of head and facial injuries in female collegiate field hockey players?

Methodology:

- Subjects: 253 female college hockey players from 6 institutions and athletes at 6 Division I institutions
- Experimental procedure: Certified athletic trainers recorded all head and facial injuries (total number of incidents, number of injuries, type of injury, location of injury, mechanism of injury and time loss due to injury) during practices and games in two seasons
- Measures of outcome: Incidents, number of head and facial injuries, injury type, location, and mechanism and time loss

Main finding/s:

- Incidents and injuries: 57 incidents occurred resulting in 62 head and facial injuries – estimated injuries per 1000 athlete exposures is 4.5
- Type of injury: Injuries to the head and face were lacerations (32%), contusions/haematomas (26%), concussions (18%), fractures (13%), dental injuries (6%)



- Time loss: Most injuries (65%) resulted in < 1 day of time lost

Conclusion/s:

- In female field hockey players there is a high number of serious or potentially serious injuries to the head and face – greater use of protective equipment may be indicated to reduce injuries

Methodological considerations:

Small sample size, actual athlete exposures were not documented, intervention may have taken place in the second year in some institutions

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In a randomized trial in a laboratory setting, sodium phosphate loading (1 gram, 4 times per day for 6 days) significantly improved mean power output and 16.1 km time-trial performance in trained cyclists

Title: Sodium phosphate loading improves laboratory cycling time-trial performance in trained cyclists

Authors: Folland JP, Stern R, Brickley G

Reference: J Sci Med Sport 2008; 11: 464-468

Type of study: Randomized, double-blind, crossover, clinical trial (laboratory)

Keywords: cycling performance, endurance, supplementation, ergogenic aids

EB Rating: 7.5/10

CI Rating: 7/10

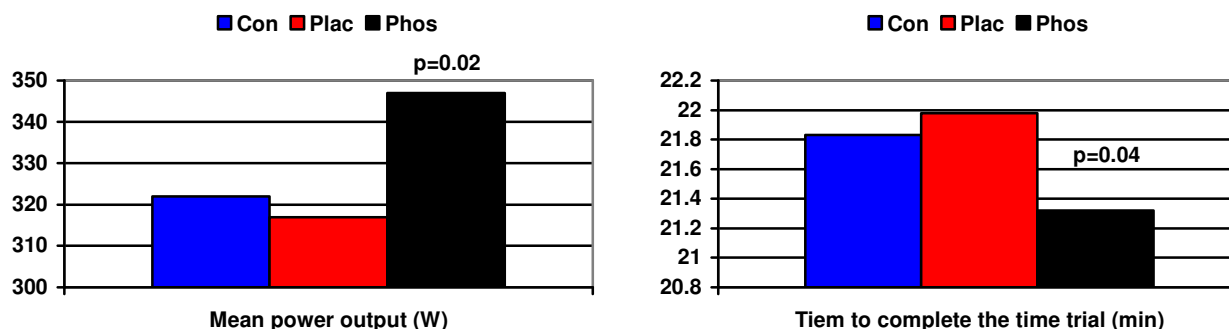
Background: Sodium phosphate supplementation has been shown to improve VO_2 peak by about 10% but its potential ergogenic effect has not been confirmed in endurance performance

Research question/s: Does sodium phosphate loading improve cycling performance during a 16.1 km cycling time-trial performance in a laboratory setting?

Methodology:

- Subjects: 6 trained male cyclists (VO_2 peak, $64.1 \pm 2.8 \text{ ml kg}^{-1} \text{ min}^{-1}$; mean \pm S.D.)
- Experimental procedure: All the subjects were screened and performed a control trial (Con). Following the Con trial subjects then performed two trials (2 weeks apart) in a randomized cross-over design. In the 6 days before each trial subjects ingested either 1 g of tribasic dodecahydrate sodium phosphate (Phos) or a lactose placebo (Plac) four times daily. Each trial consisted of a 16.1 km cycling time-trial in a laboratory setting. During the exercise trial, power output and heart rate were continually recorded and at two points during each time-trial expired air samples and capillary blood samples were taken
- Measures of outcome: Mean power output (W), time to complete the time trial (min), VO_2 (L/min), heart rate (beats/min), blood lactate (mmol/L), Rating of Perceived Exertion (RPE)

Main finding/s:



- Oxygen consumption: In the Phos trial, there was a tendency towards a higher VO_2
- Other variables: There was no significant difference between interventions for the other variables that were measured

Conclusion/s:

- In a randomized trial in a laboratory setting, sodium phosphate loading (1 gram, 4 times per day for 6 days) significantly improved mean power output and 16.1 km time-trial performance in trained cyclists

Methodological considerations:

Well conducted study

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A moderate level of weekly physical activity (991-2340 kcal/week) is associated with longer telomere length which indicates protection against cellular ageing (shortened telomere length is a biomarker of cellular ageing)

Title: Relationship between physical activity level, telomere length, and telomerase activity

Authors: Ludlow AT, Zimmerman JB, Witkowski S, Hearn JW, Hatfield BC, Roth SM

Reference: Med Sci Sports Exerc 2008; 40(10): 1764-1771

Type of study: Cross sectional study

Keywords: exercise, ageing, cellular ageing, telomeres, hTERT genotype, genetics, DNA

EB Rating: 6.5/10

CI Rating: 7.5/10

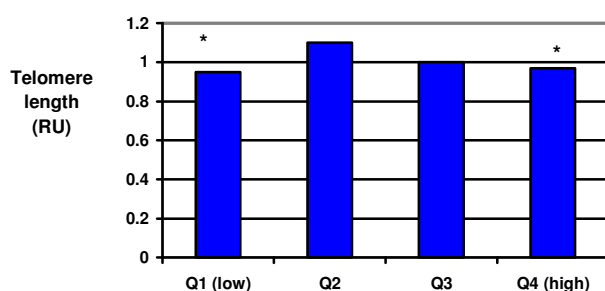
Background: Telomere length and telomerase activity are biomarkers of cellular ageing that have been associated with prolonged exercise exposure

Research question/s: Is weekly exercise energy expenditure (EEE) associated with markers of cellular ageing (telomere length and telomerase activity) in immune cells?

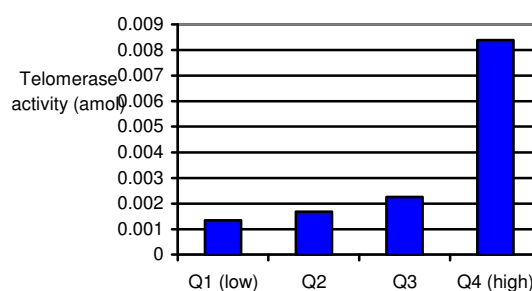
Methodology:

- Subjects: 69 subjects (male=34, female=35, 50-70yrs)
- Experimental procedure: All the subjects were assessed for weekly exercise energy expenditure (EEE) using the Yale Physical Activity Survey (YPAS) and then separated into quartiles according to weekly energy expenditure: Q1=0–990, Q2=991–2340, Q3= 2341–3540, and Q4 > 3541 kcal·wk⁻¹. Peripheral blood samples were taken and the relative telomere length, telomerase activity and hTERT genotypes (CC, TT, CT) were measured
- Measures of outcome: 1) telomere length (relative units - RU) and telomerase activity (attomoles-amol) in the quartiles of EEE, 2) the association between telomerase activity and hTERT genotypes (CC, CT, and TT)

Main finding/s:



*: p<0.05, Different from Q2



- Despite the appearance in the Figure, telomerase activity was not different among the EEE quartiles (p=0.84)
- Telomerase enzyme activity and hTERT genotype: The TT genotype had significantly greater telomerase enzyme activity than both the CT and CC groups (p=0.01)

Conclusion/s:

- A moderate level of weekly physical activity (991-2340 kcal/week) is associated with longer telomere length which indicates protection against cellular ageing (shortened telomere length is a biomarker of cellular ageing)

Methodological considerations:

Well conducted study, cross sectional study, no cause-effect shown

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