

SportsMed Update

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In a case control study, low handicap golfers with lower back pain (LBP) had increased external oblique muscle activity at the top of the back swing, but reduced erector spinae muscle activity at ball impact - these patterns increase the understanding of the possible causes or effect of LBP in golfers

Title: Electromyography of the trunk and abdominal muscles in golfers with and without low back pain

Authors: Cole MH, Grimshaw PN

Reference: J Sci Med Sport 2008; 11: 174-181

Type of study: Case control study

Keywords: golf, lower back pain, muscle activity, biomechanics

EB Rating: 6.5/10

CI Rating: 7/10

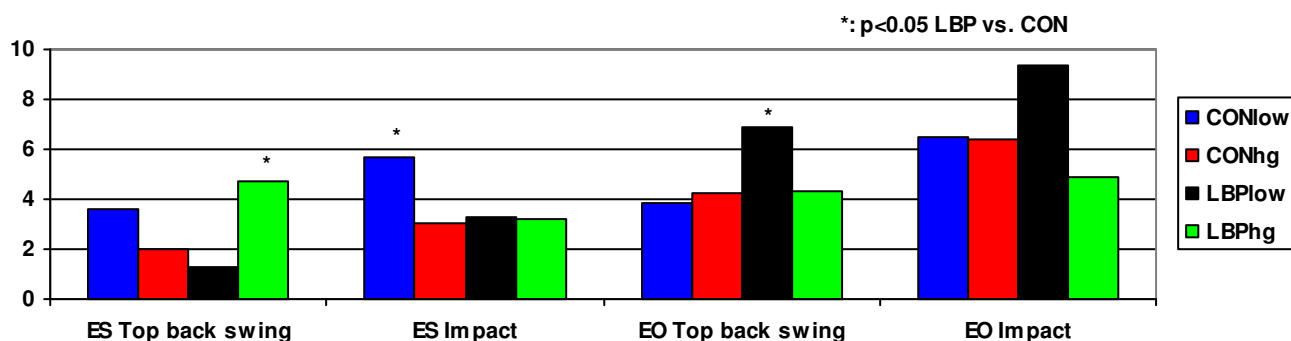
Background: There is still much confusion regarding the role that the muscles of the lower back play in the prevention of low back injuries

Research question/s: Is the muscle activity of the lumbar erector spinae and the external oblique muscles in a population of golfers suffering with lower back pain (LBP) different from that of a group of golfers without LBP?

Methodology:

- Subjects: 12 male golfers who experienced low back pain (LBP group - while playing or practicing golf) and 18 asymptomatic golfers (CON group)
- Experimental procedure: Subjects were sub-divided into handicap-specific groups: low – low handicap golfers (0-12 strokes) (CONlow=8, LBPlow=8), a handicap group (hg – 13-29 strokes)(CONhg=10, LBPhg=4). Using surface electromyography, (EMG), myoelectric activity of the lumbar erector spinae at L4 (ES) and the external obliques (EO) was measured during driving (address, top of back swing, at impact) in all the subjects. EMG activity was also recorded in the subjects while holding a mass equal to 5% of the subjects' body mass at arms length and while performing a double-leg raise.
- Measures of outcome: ES at L4 and EO EMG activity (root mean square - RMS)

Main finding/s:



- Golfers in the LBPlow sub-group tended to have reduced ES activity at the top of the backswing and at impact and greater EO activity throughout the swing, while golfers in the LBPhg sub-group had higher ES activity compared with the CON groups

Conclusion/s:

- In a case control study, low handicap golfers with lower back pain (LBP) had increased external oblique muscle activity at the top of the back swing, but reduced erector spinae muscle activity at ball impact - these patterns increase the understanding of the possible causes or effect of LBP in golfers

Methodological considerations:

Case control study – no cause effect shown, small sample size

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In elite rugby players, there is a significant increase in interstitial fluid creatine kinase (CK) concentration from pre- to post match, and this change is higher in forwards compared with backs – a significant proportion of this change in CK concentration can be explained by physical impact

Title: The relationship between changes in interstitial creatine kinase and game-related impacts in rugby union

Authors: Smart DJ, Gill ND, Beaven CM, Cook CJ, Blazeovich AJ

Reference: Br J Sports Med 2008; 42: 198-201

Type of study: Prospective cohort study

Keywords: rugby, muscle damage, impact, creatine kinase

EB Rating: 7/10

CI Rating: 7/10

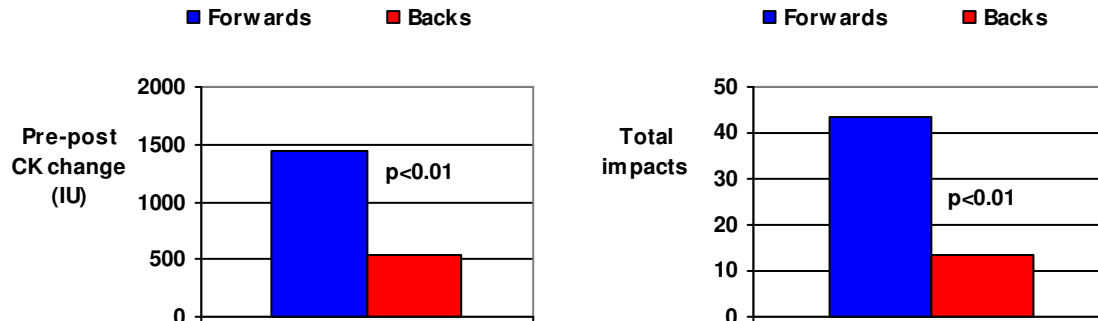
Background: Rugby union is a contact sport with significant number of body impacts during a game – this may result in muscle damage, which can be measured by creatine kinase enzyme activity in the blood or interstitial fluid

Research question/s: Are impact-related game statistics in elite rugby union players related to increases (pre-vs. post-game) changes in interstitial fluid creatine kinase concentrations (CK)?

Methodology:

- Subjects: 23 elite male rugby union players (25±3 yrs, 99.2±10.1 kg)
- Experimental procedure: Interstitial fluid samples were obtained from the players (via electrosonophoresis (EsoP) 210 min before and within a maximum time of 30 min after up to five rugby union games). In addition, game statistics for each individual player (by playing position – forwards and backs) that were important to determining the relationship between impact (sum of tackles made, hit-ups, first 3 on attack, first 3 on defense and impact/game time) and [CK] were obtained using AnalyRugby software.
- Measures of outcome: Relationship between changes in CK and game statistics

Main finding/s:



- Factors that were significantly related to increased pre-post CK changes: game time, time defending in forwards and backs

Conclusion/s:

- In elite rugby players, there is a significant increase in interstitial fluid creatine kinase (CK) concentration from pre- to post match, and this change is higher in forwards compared with backs – a significant proportion of this change in CK concentration can be explained by physical impact

Methodological considerations:

Well conducted study, interstitial fluid CK may not reflect serum CK concentrations

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A multiple hop test is described, which is a reliable and valid test to document functional performance deficits in patients with chronic ankle instability

Title: Functional performance deficits in patients with CAI: validity of the multiple hop test

Authors: Eechaute C, Vaes P, Duquet W

Reference: Clin J Sport Med 2008; 18(2): 124-129

Type of study: Case control study

Keywords: ankle injury, chronic ankle instability, functional performance, hop test, joint instability, postural control

EB Rating: 7/10

CI Rating: 7.5/10

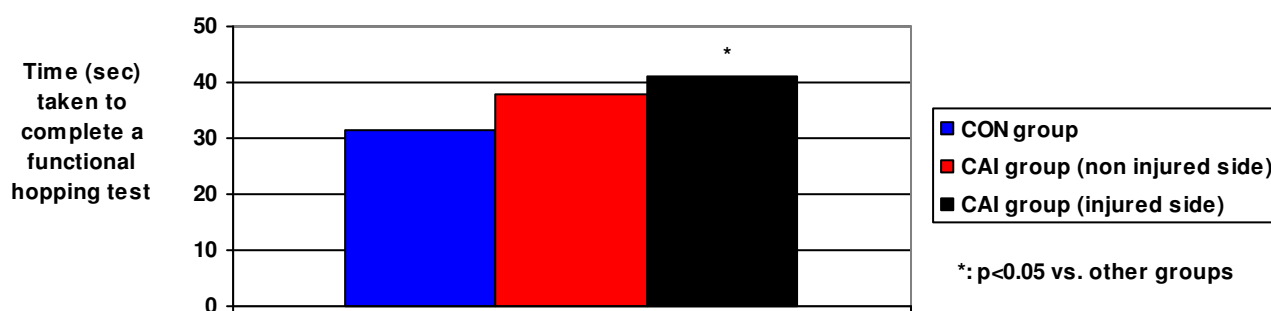
Background: Chronic ankle instability is associated with altered postural control – reliable and valid clinical tests to assess postural control are required

Research question/s: What is the reliability and validity of a functional performance test for patients with chronic ankle instability (CAI)?

Methodology:

- Subjects: 58 subjects (29 healthy control –CON group; 29 patients with chronic ankle instability – CAI group)
- Experimental procedure: All the subjects performed a multiple hop test (hopping on 10 different tape markers trying to avoid making any postural corrections, standing still before continuing) twice within a 1-week time interval. The time needed to complete the test and VAS scores for the perceived difficulty were assessed during testing on the injured and non-injured ankles)
- Measures of outcome: Time (sec), VAS (difficulty score)

Main finding/s:



- Intra-class correlations between test-retest times for unstable ankles were > 0.90
- VAS difficulty score: Patients perceived the test as significantly more difficult than did healthy subjects in the dominant ankles

Conclusion/s:

- A multiple hop test is described, which is a reliable and valid test to document functional performance deficits in patients with chronic ankle instability

Methodological considerations:

Well conducted study

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In a randomized controlled clinical trial, 12 weeks exercise training decreased bronchial responsiveness to methacholine in children with mild stable asthma – adding a leukotriene antagonist (Montelukast) decreased bronchial reactivity (FEV₁ slope) and protected against asthma exacerbations

Title: Effects of exercise training and montelukast in children with mild asthma

Authors: Bonsignore MR, La Grutta S, Cibella F, Scichilone N, Cuttitta G, Interrante A, Marchese M, Veca M, et al

Reference: Med Sci Sports Exerc 2008; 40(3): 405-412

Type of study: Randomized, controlled, clinical trial

Keywords: asthma, children, exercise training, montelukast, bronchial responsiveness, methacholine, leukotrienes

EB Rating: 7.5/10

CI Rating: 7.5/10

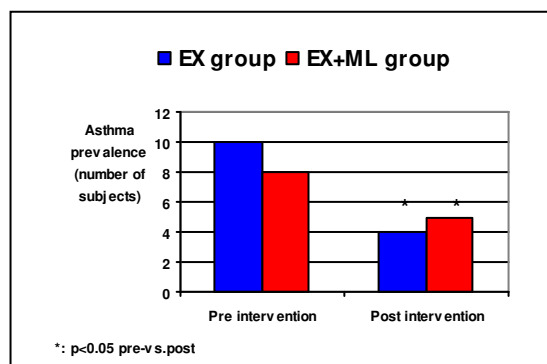
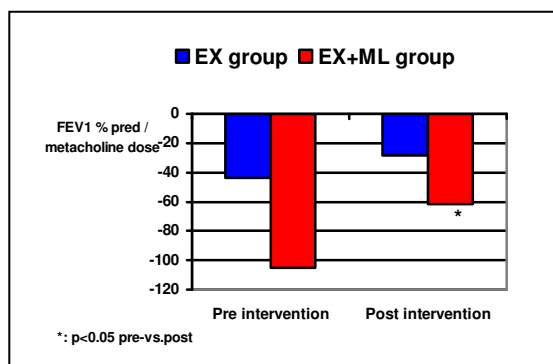
Background: Regular exercise training may decrease bronchial responsiveness, but the possible role of exercise alone or in combination with a leukotriene receptor antagonist in asthmatic children has not been studied

Research question/s: Does exercise alone, or combined with a leukotriene receptor antagonist montelukast, reduce bronchial responsiveness (BHR) to methacholine, exercise-induced bronchoconstriction (EIB), inflammatory markers in exhaled breath condensate (EBC), and asthma exacerbations in children with mild asthma?

Methodology:

- Subjects: 50 children (10.2±2.4 yrs) with mild stable asthma (symptoms < 1 / week, β₂ agonist use only)
- Experimental procedure: Subjects were assessed fully (clinical, exercise stress test, spirometry, BHR, EIB and markers of airway inflammation [exhaled nitric oxide (eNO), pH, and cysteinyl-leukotriene concentration in exhaled breath concentrate-EBC]. All subjects underwent 12 weeks of exercise training (60 min, 4/wk) but were randomly assigned to either exercise alone (EX=25) or exercise and montelukast (EX+ML=25). Following the 12 week intervention training, all parameters were re-assessed.
- Measures of outcome: Exercise training (maximal workload), BHR, EIB prevalence, asthma exacerbations

Main finding/s:



- Exercise training: In both groups there was an increase in maximal workload
- Airway inflammation: The resting eNO was unaffected, and pH of EBC decreased after training in both groups
- Asthma exacerbations: Fewer asthma exacerbations were seen in the EX+ML compared with the EX group

Conclusion/s:

- In a randomized controlled clinical trial, 12 weeks exercise training decreased bronchial responsiveness to methacholine in children with mild stable asthma – adding a leukotriene antagonist (Montelukast) decreased bronchial reactivity (FEV₁ slope) and protected against asthma exacerbations
- This suggested there may be a synergistic effect action between these two interventions

Methodological considerations:

Well conducted study

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Caffeine ingestion (5mg/kg), 60 min before running in runners, (well trained and recreational) significantly improves the 5-km running performance

Title: Caffeine has a small effect on 5-km running performance of well-trained and recreational runners

Authors: O'Rourke M, O'Brien BJ, Knez WL, Paton CD

Reference: Journal of Science and Medicine in Sport 2008; 11: 231-233

Type of study: Randomized, double-blind, placebo-controlled, clinical trial

Keywords: caffeine, exercise, performance, running, ergogenic aids

EB Rating: 7.5/10

CI Rating: 7/10

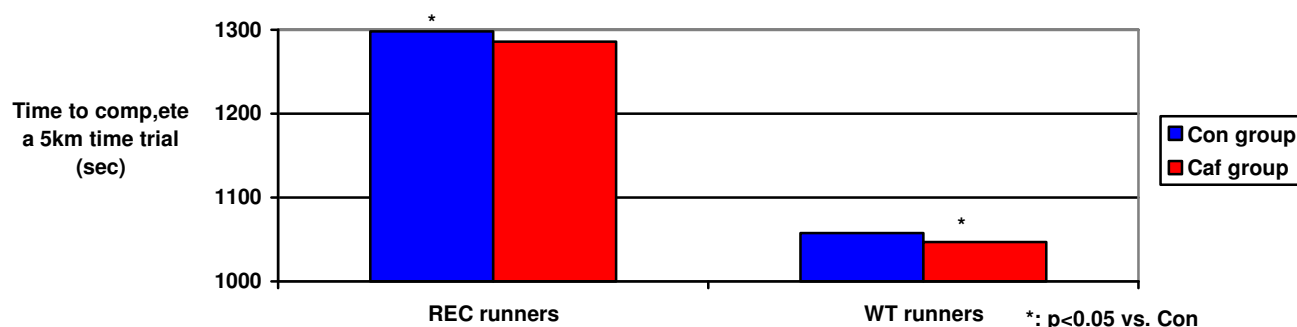
Background: Caffeine ingestion may improve running performance in recreational and well trained runners

Research question/s: Does caffeine ingestion improve 5-km time-trial performance in well-trained and recreational runners?

Methodology:

- Subjects: 15 well-trained runners (WT Run, 32.2±8.8 yrs, 68.9±6.1 kg) and 15 recreational runners (REC Run, 29.0±5.7 yrs, 71.8±13.6 kg)
- Experimental procedure: All the subjects were assessed and then completed two 5-km time-trials around a 400m track in a randomized fashion 1 hour after either placebo (Con) or 5 mg kg⁻¹ of caffeine (Caf) ingestion.
- Measures of outcome: Time to complete a 5km time trial (sec)

Main finding/s:



- Caffeine ingestion resulted in 1.1% and 1.0% faster times in the WT and the REC runners respectively

Conclusion/s:

- Caffeine ingestion (5mg/kg), 60 min before running in runners, (well trained and recreational) significantly improves the 5-km running performance

Methodological considerations:

Well conducted study

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