Abstracts

001 EFFECTS OF BODY COMPOSITION MEASURES ON DIMENSIONS OF CARDIO-RESPIRATORY FITNESS

M. Siahkohiyan, F. Rahamaninia, U. Barahmand. Mohaghegh Ardalbei University, Iran

The effects of body composition measures on different dimensions of cardio-respiratory fitness have come to be an important aspect of research programmes in sports and exercise science. The present study aimed at exploring the effects of body composition variables on relative cardio-respiratory fitness based on body mass (ml/kg (LBMI)/min), relative cardio-respiratory fitness based on fat free mass (ml/kg (LBM)/min) and absolute cardio-respiratory fitness in employees of Mohaghegh Ardalbei University. To this end, the subjects (mean ± SD age 33.62 ± 7.07 years, height 172 ± 6.65 cm, weight 79.59 ± 11.9 kg) were divided into two groups as obese and non-obese. Cardio-respiratory fitness was assessed using sub maximal Ebbing treadmill protocol and body composition variables were measured using valid mechanical skin fold caliper and Jackson-Pollack 3 point equation. Findings revealed that relative cardio-respiratory fitness based on body mass of obese subjects was significantly lower than that of non-obese subjects (41.99 ± 10.23 vs 47.98 ± 8.47, p<0.01). In contrast, when relative cardio-respiratory fitness based on fat free body mass VO2 max (ml/kg (LBMI)/min) was considered, no significant group differences were observed (57.44 ± 9.22 vs 54.32 ± 13.14). Furthermore, a significant negative correlation was obtained between body fat percentage and relative cardio-respiratory fitness based on body mass (ml/kg (BM)/min) (r = -0.376). However, no significant correlations were observed between body fat percentage and relative cardio-respiratory fitness based on fat free mass VO2 max (ml/kg (LBMI)/min) and absolute cardio-respiratory fitness (l/min) (r = -0.097, r = -0.043). Based on the above findings, it can be concluded that body fat percentage significantly influences cardio-respiratory fitness and is, therefore, a determinant of cardio-respiratory fitness.

Keywords: body composition; cardio-respiratory fitness; body fat percentage

002 BENEFITS OF STRENGTH AND PLYOMETRIC TRAININGS ON ATHLETIC PERFORMANCES IN PREADOLESCENT SOCCER PLAYERS

C. Lehanne, I. Reiffers, T. Bury. Department of Sports Physiology, University of Liege, Belgium

The aim of this study was to investigate the effectiveness of strength training combined with plyometric training on physical performances in preadolescent soccer players.

Twenty six boys aged 13–14 years were randomly assigned to two groups: a training group (TG, n = 13) and a control group (CG, n = 13). The skeletal age was used as reference and not the chronological one. The training programmes were carried out under adequate supervision, two times (1 hour) weekly during 10 weeks. The training session consisted firstly of a general and personalised programme of strength training (basic exercises for the major muscle groups) and secondly plyometric exercises including jumping, hurdling, and skipping. Parallel to the TG sessions, CG performed soccer training. Anaerobic power performances were assessed by using the following tests: countermovement jump (CMJ), countermovement jump free arms (CMJ fr.), standing long jump (SLJ), multiple 5 bounds (MB5), and 30 m sprint (with sprint times at 10 m, 20 m and 30 m).

Before training, anthropometric characteristics and anaerobic power performances were similar between TG and CG. After the training programme, all participants of the TG achieved significant strength and none experienced a training-related injury. CMJ (p<0.001), CMJ fr. (p<0.001), SLJ (p<0.01), MB5 (p<0.01), and 10 m sprint time (p<0.01) performances increased significantly in the TG. Except for the 10 m sprint time (p>0.05), none of the variables tested in the CG demonstrated difference between the pre-test and the post-test.

Our results clearly indicate that participation in a supervised of strength and plyometric exercises can improve athletic performances in preadolescent soccer players. This is possible because strength development is associated with a variety of neuromuscular factors and does not solely depend on muscular mass.

003 SCOTTISH TRAUMA AUDIT GROUP: A 10 YEAR STUDY OF MAJOR SPORTS INJURIES ATTENDING ACCIDENT & EMERGENCY DEPARTMENTS IN SCOTLAND

S. H. Boyce1, M. A. Quigley2. 1Specialist Registrar Accident & Emergency, Western Infirmary, Glasgow; 2Associate Specialist Accident & Emergency, Dumfries and Galloway Royal Infirmary, Dumfries

Background: In 1991, the Scottish Trauma Audit Group (STAG) began a prospective audit of seriously injured patients presenting to Accident & Emergency (A&E) departments in Scotland. Entry criteria involved all trauma patients who are hospitalised for at least three days or who die because of their injuries. Patients are followed until discharge, three months in-patient stay, or death. Children (under 13 years) and isolated fracture neck of femur or pubic rami over 65 are excluded. STAG currently holds data on nearly 50 000 patients.

Objective: To determine the incidence, severity, management, and outcome of all major sports injuries, fulfilling the STAG criteria, attending 26 A&E departments in Scotland over a ten year period.

Method: The STAG database was accessed and the following demographic trends analysed: incidence of overall injury, incidence of injury at each hospital, daily and seasonal effects upon injury, age/sex of injured patients, type of sport involved, mode of presentation to A&E, time to be seen by a doctor, seniority of examining doctor and time spent within the A&E department, injury severity, anatomical area of injury, disposal and definitive care, outcome versus injury severity. All other sports injuries presenting to A&E but not satisfying STAG inclusion criteria are excluded.

Results: 2519 patients (5.1%) of the STAG database were sports injuries. Incidence ranged from 2.2–11.8% at each hospital. Injuries peaked on weekends and seasonally during Spring and Autumn. 79% of injuries affected males with the majority occurring in the under 40 age group. Football was the most common sport causing injury (48.9%) followed by horse riding (10.0%) and rugby (5.2%). 68.5% of patients arrived via an emergency ambulance. 80% of patients were seen within one hour of arrival at A&E and 92% had left the department within four hours. Most patients were assessed by a junior doctor (SHO 57.5%, HO3 6.7%, SpR 21.1%). Using the Injury Severity Scale (ISS) 38.4% were defined as minor injuries (ISS 1–8), 58.8% moderately injured (ISS 9–15), and 2.8% seriously injured (ISS 16–75). 75% of patients had a moderate or serious injury to the lower limb defined by the Abbreviated Injury Scale (AIS). 75% of all admissions underwent an orthopaedic operative procedure. 2.5% of patients had a deceased conscious level and 2.7% had a reduced Revised Trauma Score (RTS) on presentation. A CT Scan was performed in 10.5% of cases. Average in-patient stay was between 3–7 days (79%). Outcome was expressed only in terms of “alive” or

Abstract 002

Gains obtained after the training session. CMJ: countermovement jump; CMJ fr.: countermovement jump free arms; SLJ: standing long jump; MB5: multiple 5 bounds. **p<0.05 ***p<0.01 ***p<0.001

www.bjsportmed.com
**004 PREVALENCE OF FOOT/ANKLE PROBLEMS IN ELITE ORIENTEERS**

C. P. Kelly, E. Roos. Dept of Orthopaedics, Lund University, Lund, Sweden

**Aim:** The purpose of this study was to examine the prevalence of ankle/foot problems in elite orienteers by subjective assessment of ankle impairment and dysfunction.

**Methods:** Elite athletes of 23 national orienteering teams participated; 86 male and 73 female, mean age 28 years (range 18–43). The ankle/foot and whole body score (FAOS) was the chosen method of evaluation. This validated questionnaire data was collected at two major orienteering events: European and World championship events (2004), both of which took place in Scandinavian terrain. Specific ankle diagnoses for each athlete were not recorded during this time.

**Results:** Prevalence data revealed that 60% of all athletes experienced pain on a monthly to always basis while 50% experienced morning stiffness and 30% had problems bending and straightening the ankle/foot on a mild to extreme basis. Quality of life results revealed 70% off all athletes were aware of their ankle problem on a monthly to constant basis, 62% modified their life and had decreased confidence on a mild to total scale, and 67% recorded "general difficulty". In an analysis of final race result, those athletes with poorer race results recorded statistically significant ankle/foot problems.

**Conclusion:** A large percentage of elite orienteers have a high prevalence of ankle/foot problems. This raises a few questions regarding the adequacy of classification and management of ankle/foot injuries and also the education and prevention/screening programmes.

**Aircast basem travelling fellowship**

**005 A CLOSE LOOK AT THE HUMAN TENDON: BASIC BIOLOGY; GENE, PROTEIN, AND ELECTROPHYSIOLOGICAL EXPRESSION OF ION CHANNELS**

M. Magra1, S. Hughes2, A. El Haj3, N. Mafulli1. 1Department of Trauma and Orthopaedic Surgery, Keele University School of Medicine, Stoke-on-Trent, ST4 7QB Staffordshire, UK; 2Institute of Science and Technology in Medicine, Keele University School of Medicine, Stoke-on-Trent, ST4 7QB Staffordshire, UK

**Introduction:** Musculoskeletal system cells exhibit mechanotransduction. Ion channels may play a key role in some or all initial responses to mechanical load. Tenocytes are able to adapt to altered mechanical loading conditions by changing their structure, composition, and mechanical properties. Mechanical forces trigger stretch-activated ion channels permitting calcium influx. Calcium is one of the primary second messengers utilised by cells to convert mechanical signals to biochemical messengers.

**Methods:** Patellar tendon samples were harvested from five patients undergoing routine total knee replacement surgery (mean age: 66 years; range 63–73 years). Tenocytes were isolated and cultured in a monolayer. RNA and protein was extracted. RT-PCR, western blotting and whole cell electrophysiological studies were performed.

**Results:** Human tenocytes express genes for TREK-1 and VOCCs (Ca**\(^{2+}\)) channels. Also, calcium and potassium currents were isolated using whole cell electrophysiological studies. The currents recorded statistically significant ankle/foot problems.

**Conclusion:** A large percentage of elite orienteers have a high prevalence of ankle/foot problems. This raises a few questions regarding the adequacy of classification and management of ankle/foot injuries and also the education and prevention/screening programmes.

**Abstract 006 illustrates the injured body areas. Many casualties had injuries to two or more sites and there were 24 fractures (22 in the upper limb)**

<table>
<thead>
<tr>
<th>Injured Area</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Limb</td>
<td>40 (41.6)</td>
</tr>
<tr>
<td>Head + face</td>
<td>18 (18.8)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>17 (17.7)</td>
</tr>
<tr>
<td>Chest</td>
<td>10 (10.4)</td>
</tr>
<tr>
<td>Abdomen</td>
<td>2 (2.1)</td>
</tr>
<tr>
<td>Back (including neck)</td>
<td>5 (5.2)</td>
</tr>
<tr>
<td>Pelvis</td>
<td>1 (1.0)</td>
</tr>
</tbody>
</table>

It is possible that malfunctioning ion channels may lead to tendinopathic changes. Ion channels may form potential targets for the pharmacological management of chronic tendinopathies. Further research into the therapeutic applications of ion channels in conditions like chronic tendinopathy is required.

**006 MOUNTAIN BIKING IN SOUTH WEST SCOTLAND: AN ANALYSIS OF INJURIES ATTENDING A&E**

M. A. Quigley, S. H. Boyce. Accident Unit Dumfries and Galloway Royal Infirmary, Bankend Road, Dumfries, DG1 4AP

**Aim:** Over the last three years the forests of South West Scotland have been developed into the UK’s leading mountain-bike region. We examined the injuries and workload generated for the A&E department of the local district hospital. In an attempt to address accident prevention issues we gathered data about levels of experience, type of mountain-biking, equipment used, and factors contributing to the accidents.

**Methods:** During 2004 we performed a prospective study of the injuries that attended the emergency department. We extracted the relevant demographic and injury details from the patient’s notes. The bikers completed a questionnaire about their accident/experience/equipment etc.

**Results:** Eighty six patients attended with injuries during the year. 73/86 (85%) were male, with the average age being 30 (range 7–65 years). The peak attendance occurred during June (14 patients). Seven patients (8%) were admitted, 46 (53%) were discharged, and 33 (38%) were seen in out-patient clinics. Those admitted included a perforated abdominal viscus, a fractured T5/6 vertebra, a pneumothorax, a displaced fractured clavicle, a displaced medial epicondyle fracture, a potential L3/L4 fracture and facial injuries requiring debridement and suturing. We obtained completed questionnaires for 78/86 (91%) of patients. Sixty four bikers were undertaking recreational cycling at the time of their accident and 14 were competing. The majority were cross-country cycling (54) with only 16 engaging in downhill racing and eight freeriding. Most of our cyclists were wearing helmets (72, 92%) though only 15 were using full-face protection. Eye protection was used in 47% and gloves were worn by 79%. 13/78 (17%) were using body armour (10 of these were downhill cyclists) and at least 18 others were seen other form of body protection. The cyclists reported that their accidents were low speed in 65% of cases and the most frequently cited reason for falling was rider error (64% of accidents).

**Conclusions:** As a result of the mountain-biking developments in South West Scotland we see approximately seven injuries per month in the accident unit. The casualties are mainly young males who have on average five years mountain-biking experience. The majority are minor orthopaedic injuries and affect the upper limb. Few are admitted but a significant proportion (38%) require out-patient management. Most accidents are in recreational cyclists and are not due to excessive speed. Most cyclists wear helmets, but with the head and face being the second most commonly injured site greater consideration should be given to use of full-face helmets.

Only 39% wore body protection. "Stunt and trick-riding over manmade/natural obstacles"
A THREE-DIMENSIONAL ANALYSIS OF THE AMOUNT OF AVAILABLE TRUNK MOTION UTILISED DURING FAST BOWLING IN CRICKET

N. Patel, C. Ranson, A. Burnett. Centre for Sports Medicine, Queen’s Medical Centre, University of Nottingham, Nottingham, UK

Aims: To determine the phase of the fast bowling delivery stride, back foot contact to front foot contact (BFC-FCC) or FCC to ball release (BR), where the greatest proportion of lumbar spine range of motion (ROM) is utilised.

Methods: The lumbar kinematics of 26 professional male fast bowlers was captured utilising a Vicon Motion Analysis System. The kinematic data was then processed to obtain the bowling action type (front-on, midway, side-on, and mixed) and the lumbar ROM (extension, side-flexion, and rotation) during (i) standing and (ii) fast bowling. The percentage of standing lumbar ROM that is utilised during each of the fast bowling action types was then obtained.

Results:
- 77% of bowlers used a mixed action.
- The greatest proportion of lumbar ROM was used during contralateral lumbar side-flexion (124.62%) and ipsilateral lumbar rotation (78.57%) during the FFC-BR phase of the delivery stride. Maximal lumbar extension also occurred during this phase (87.97%).
- Mixed action bowlers used more of the available ROM of ipsilateral rotation but not side-flexion or extension.

Conclusions:
- Fast bowling actions are currently classified according to shoulder alignment at back foot contact (BFC) whilst the kinematics likely to be responsible for the type of stress injuries suffered by fast bowlers occur much later in the delivery stride—that is, maximal extension, contralateral side-flexion, and ipsilateral rotation just after FCC.
- The current action classification is insensitive as a majority of bowlers used the reportedly “dangerous” mixed action.
- For the above reason the current system is probably not useful for accurately determining the “safety” of fast bowling actions.


IS THE BIERING-SORENSEN TEST A SUITABLE TEST OF FATIGUE IN ADDITION TO ENDURANCE IN THE BACK MUSCLES?

A. Crowther, A. H. McGregor, P. H. Stratton. Biodynamics Group, Imperial College London, Charing Cross Hospital Campus, Fulham Palace Road, London W6 8MP, UK

Muscle fatigue has high relevance in human performance and may contribute to the high incidence of back pain amongst athletes. However, the term fatigue is often poorly defined and is used inconsistently, frequently being interchanged with endurance. This study aimed to establish whether the Biering-Sorensen (B/S) test is a suitable test of fatigue as well as endurance for the back extensors.

Twenty medical students were subjected to two protocols (A & B). Using a Cybex Norm Isokinetic Dynamometer, the isometric peak torques during extension and flexion were measured before and after each protocol. Protocol A involved a 45 second maximal isometric contraction while protocol B entailed a B/S (submaximal) test for extension and a sit up crunch for flexion. Extension testing followed flexion testing.

Significant reduction in peak mean torque occurred only in flexion for both protocols. The B/S test did not result in a decrease in peak torque suggesting minimal fatigue. A weak correlation was found between the length of time the B/S test was held and the fatigue index. The B/S test does not induce significant fatigue in the trunk extensors and remains a test of endurance. Further research is required to develop an effective protocol to assess trunk extensor fatigue.

SURGERY FOR CHRONIC ACHILLES TENDINOPATHY YIELDS WORSE RESULTS IN SEDENTARY PATIENTS

M. K. Sayana, N. Maffulli, V. Testa, G. Capasso, F. Oliva, A. Sullo, F. Benazzo, R. Regine, J. B. King. Department of Trauma and Orthopaedic Surgery, Keele University School of Medicine, Stoke on Trent, ST4 7QB, UK

Aim: To report the outcome of surgery for chronic recalcitrant Achilles tendinopathy in sedentary and athletic subjects.

Methods: We matched each of the 61 non-athletic patients with tendinopathy of the main body of the Achilles tendon with an athletic patient with the same diagnosis of the same sex, and who was within two years of age at the time of operation. A match was possible for 36 patients (23 males and 33 females). Forty eight sedentary subjects and 45 athletic subjects agreed to participate. The main outcome measures were: outcome of surgery, return to sport, complication rate.

Results: Non-athletic patients were shorter and heavier than athletic patients. They had greater BMI, calf circumference, side-to-side calf circumference differences, and subcutaneous body fat than athletic patients. Of the 48 sedentary patients, only 25 reported an excellent or good result. Of these, three had undergone a further exploration of the Achilles tendon. The remaining patients could not return to their normal levels of activity. In all of them, pain significantly interfered with daily activities.

Conclusions: Non-athletic subjects experience more prolonged recovery, more complications, and a greater risk of further surgery than athletic subjects with recalcitrant Achilles tendinopathy.

BIOLOGICAL FIXATION IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTIVE SURGERY FOR EARLY FUNCTIONAL REHABILITATION

M. Bhattacharyya, B. Gerber. University Hospital Lewisham, Lewisham, UK

Aim: To illustrate our clinical experience of using a complete biological method of fixation in ACL surgery with early rehabilitation programme.

Materials: Eighteen male patients of mean age 31.2 years (range 18 to 50 years) were operated on. The autogenous graft was prepared from the lateral part of the quadriceps aponeurosis, part of the patella and ligament leaving distal tibial attachment, passed through the trans-osseous tunnel so that bony part of the graft stayed within the femoral tunnel, and the remaining part was sutured with the ilio-tibial tract.

Patients began immediate exercises with continuous-passive-motion devices in the recovery room. With 100 degrees of knee motion, they were allowed to bear full weight on the operatively treated limb with the knee in a brace at extension.

Results: Three patients had superficial wound infection and two had haemarthrosis. None had any laxity or flexion contracture. Mean flexion arc was 135 (130–145) degrees.

Conclusion: We describe the procedure of the biological fixation method in ACL reconstruction surgery. We attempted to preserve the biological integrity of the patellar ligament distally in the tibial end and facilitate biological integration producing a bone block in the femoral tunnel. This study confirms early rehabilitation programmes may be started in cases where the biological fixation method is adopted.

RISK FACTORS FOR INJURY IN YOUNG COMPETITIVE FEMALE GYMNASTS

D. J. Caine, R. M. Daly, D. Jolly, B. H. Hagel, B. Cochrane. University of Oregon, Eugene, OR, USA

Aim: To determine risk factors that best predict injury incidence among young competitive female gymnasts.

Methods: A prospective cohort of 54 competitive female gymnasts, aged 7–17 years, were tested at baseline on a variety of measures and followed for one year. Injury was defined as one that occurred as a result of gymnastics participation and limited the gymnast from full participation. Poisson regression-based generalised estimating equations were used to estimate incidence rate ratios (IRR, 95% CI).

Results: Fifty-four gymnasts incurred 17.5 injuries per 1000 athletic-exposures. In univariate analysis (see table), significant risk factors for injury (total) included previous injury to same side/region and other regions, a positive musculoskeletal assessment (pre-season pain in same side/region), height and peri-pubertal status. When analysed by injury onset, these same predictors were significant for overuse, but not for acute injuries. When analysed by specific body region (spine/trunk, lower extremity, and upper extremity), similar significant injury predictors were found. Predictor variables that remained significant in multivariate analysis are shown in bold in the table.

www.bjsportmed.com
Abstract 011

Conclusions: These results highlight the importance of pre-season injury history and musculoskeletal screening of competitive female gymnasts, with appropriate follow-up treatment, physical therapy, and adjustments to training.

012 DOES HIGH DOSE CREATINE SUPPLEMENTATION CHANGE BODY COMPOSITION WITHOUT IMPORTANT ADVERSE EFFECTS IN SEDENTARY HEALTHY MALES SUBMITTED TO AEROBIC TRAINING?


The purpose of this study was to evaluate the effects of creatine supplementation on body composition (BC) and its adverse effects in sedentary healthy males submitted to exercise training.

In a double-blind, placebo-controlled trial, 16 subjects were randomly assigned to two groups: (1) creatine (CR – dose: 0.3 g/day/kg of body weight for the first week, and 0.15 g/day/kg of body weight for the next three months); (2) placebo (PL – equal amount of dextrose). Both groups underwent moderate aerobic training, three times a week, 40 minutes a session. The run intensity was 70% of VO2 maximal determined by VO2 maximal test. Tests for high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), very low-density lipoprotein cholesterol (VLDL), total cholesterol (TC), triglyceride (TAG), and fasting insulin (FI) were performed. Tests were performed at baseline (PRE) and after four (POST 4), eight (POST 8), and 12 weeks (POST 12). Significance level adopted was p < 0.05.

These findings suggest that creatine supplementation plus aerobic training can improve lipid profile in healthy sedentary male, without altering FI concentration.

013 EFFECTS OF CREATINE SUPPLEMENTATION ON LIPID PROFILE AMONG HEALTHY SEDENTARY SUBJECTS SUBMITTED TO AEROBIC TRAINING


The aim of this study was to evaluate the effects of creatine supplementation on lipid profile and thereafter insulin level, which can modulate plasmatic lipoproteins. Sixteen healthy sedentary males were randomly allocated into two groups: (1) creatine (CR – dose: 0.3 g/day/kg of body weight for the first week, and 0.15 g/day/kg of body weight for the next three months); (2) placebo (PL – dextrose), same dose cited above) in a double-blind fashion. Both groups were submitted to aerobic training, three times a week, 40 minutes a session. The run intensity was 70% of VO2 maximal determined by VO2 maximal test. Tests for high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), very low-density lipoprotein cholesterol (VLDL), total cholesterol (TC), triglyceride (TAG), and fasting insulin (FI) were performed. Tests were performed at baseline (PRE) and after four (POST 4), eight (POST 8), and 12 weeks (POST 12). Significance level adopted was p < 0.05.

The CR supplementation resulted in a significantly decreased TAG and increased HDL after POST 4 and POST 8, respectively. No differences were noted in LDL, CT, and FI for both groups. These findings suggest that creatine supplementation plus aerobic training can improve lipid profile in healthy sedentary male, without altering FI concentration.

014 EFFECTS OF CREATINE SUPPLEMENTATION PLUS AEROBIC TRAINING ON GLUCOSE TOLERANCE AND INSULIN SENSITIVITY AMONG HEALTHY SEDENTARY MEN


This study aimed to examine the effects of creatine supplementation on glucose tolerance and insulin sensitivity among sedentary men. Subjects (n = 16) were randomly divided into two groups in a double-blind fashion: (1) creatine (CR – dose: 0.3 g/day/kg of body weight for the first week, and 0.15 g/day/kg of body weight for the next three months); (2) placebo (PL – equal amount of dextrose). Both groups underwent moderate aerobic training, three times a week, 40 minutes a session. The oral glucose tolerance test (OGTT) was performed and the homeostasis model assessment (HOMA) was determined. Tests were performed at baseline (PRE), after four (POST 4), eight (POST 8), and 12 weeks (POST 12).

Only the CR, there was a significant improvement regarding the area under the curve (from OGTT) at the moments POST 4, 8, and 12 when compared to PRE (p < 0.05). HOMA did not change significantly in either group.

These results suggest that creatine supplementation plus aerobic training can improve glucose tolerance, but not insulin sensitivity. These findings can lead to future research with diabetics and glucose intolerant subjects.

015 ARE CHANGES IN KNEE EXTENSOR ECCENTRIC STRENGTH ASSOCIATED WITH CHANGES IN PAIN AND FUNCTION IN PATIENTS REHABILITATING FROM PATELLO-FEMORAL PAIN?

G. S. Herath, A. K. Wills, I. McCurdie, J. Etherington. Defence Medical Rehabilitation Centre, Headley Court, Epsom, Surrey KT18 0LN, UK

 Aim: To assess whether changes in knee extensor eccentric strength (KES) at particular isokinetic speeds are associated with changes in pain and function during the rehabilitation of patello-femoral pain (PFP).
Abstract 015  Correlation coefficients between KEES and PI, PA and FIQ, p values are in brackets

<table>
<thead>
<tr>
<th>Eccentric strength (isokinetic)</th>
<th>Pain intensity</th>
<th>Pain affect</th>
<th>FIQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>30°/s</td>
<td>-0.23 (0.24)</td>
<td>-0.27 (0.15)</td>
<td>-0.08 (0.69)</td>
</tr>
<tr>
<td>60°/s</td>
<td>-0.26 (0.17)</td>
<td>-0.33 (0.07)</td>
<td>-0.31 (0.27)</td>
</tr>
<tr>
<td>120°/s</td>
<td>0.41 (0.03)*</td>
<td>0.32 (0.09)</td>
<td>0.22 (0.24)</td>
</tr>
</tbody>
</table>

Methods: Thirty subjects (8 females) with chronic PFP underwent a multi-disciplinary assessment, education package, and 12 week home-based exercise rehabilitation programme. Measurements of pain intensity (PI) and pain affect (PA) (VAS), function (functional index questionnaire – FIQ) and KEES at isokinetic speeds of 30°/s, 60°/s and 120°/s were performed at baseline and at 12 weeks. Pearson correlation coefficients (r) were used to test for a linear association between changes in pain and function and changes in KEES.

Results: There was no significant association between change in PI or PA and change in KEES at any test speed, although change in PA showed a slightly stronger association. The change in FIQ was significantly associated with the change in KEES at the lowest speed. This relationship was weaker at the faster speeds.

Conclusions: Whilst this study cannot imply that increases in eccentric strength caused improvement in function, some linear association existed, suggesting eccentric strength training is worthwhile in rehabilitating PFP. The pattern of the correlations suggests that it is more sensitive to assess strength at slower speeds.


Abstract 018  Correlation coefficients between KEES and PI, PA and FIQ, p values are in brackets

<table>
<thead>
<tr>
<th>Upper limbs</th>
<th>Lower limbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP (W.Kg⁻¹)</td>
<td>M F M F</td>
</tr>
<tr>
<td>MP (W.Kg⁻¹)</td>
<td>M F M F</td>
</tr>
<tr>
<td>0.23 (0.24)</td>
<td>0.27 (0.15)</td>
</tr>
<tr>
<td>0.26 (0.17)</td>
<td>0.33 (0.07)</td>
</tr>
<tr>
<td>0.41 (0.03)*</td>
<td>0.32 (0.09)</td>
</tr>
</tbody>
</table>

Methods: Thirty subjects (8 females) with chronic PFP underwent a multi-disciplinary assessment, education package, and 12 week home-based exercise rehabilitation programme. Measurements of pain intensity (PI) and pain affect (PA) (VAS), function (functional index questionnaire – FIQ) and KEES at isokinetic speeds of 30°/s, 60°/s and 120°/s were performed at baseline and at 12 weeks. Pearson correlation coefficients (r) were used to test for a linear association between changes in pain and function and changes in KEES.

Results: There was no significant association between change in PI or PA and change in KEES at any test speed, although change in PA showed a slightly stronger association. The change in FIQ was significantly associated with the change in KEES at the lowest speed. This relationship was weaker at the faster speeds.

Conclusions: Whilst this study cannot imply that increases in eccentric strength caused improvement in function, some linear association existed, suggesting eccentric strength training is worthwhile in rehabilitating PFP. The pattern of the correlations suggests that it is more sensitive to assess strength at slower speeds.


Abstract 018  Correlation coefficients between KEES and PI, PA and FIQ, p values are in brackets

<table>
<thead>
<tr>
<th>Eccentric strength (isokinetic)</th>
<th>Pain intensity</th>
<th>Pain affect</th>
<th>FIQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>30°/s</td>
<td>-0.23 (0.24)</td>
<td>-0.27 (0.15)</td>
<td>-0.08 (0.69)</td>
</tr>
<tr>
<td>60°/s</td>
<td>-0.26 (0.17)</td>
<td>-0.33 (0.07)</td>
<td>-0.31 (0.27)</td>
</tr>
<tr>
<td>120°/s</td>
<td>0.41 (0.03)*</td>
<td>0.32 (0.09)</td>
<td>0.22 (0.24)</td>
</tr>
</tbody>
</table>

Methods: Thirty subjects (8 females) with chronic PFP underwent a multi-disciplinary assessment, education package, and 12 week home-based exercise rehabilitation programme. Measurements of pain intensity (PI) and pain affect (PA) (VAS), function (functional index questionnaire – FIQ) and KEES at isokinetic speeds of 30°/s, 60°/s and 120°/s were performed at baseline and at 12 weeks. Pearson correlation coefficients (r) were used to test for a linear association between changes in pain and function and changes in KEES.

Results: There was no significant association between change in PI or PA and change in KEES at any test speed, although change in PA showed a slightly stronger association. The change in FIQ was significantly associated with the change in KEES at the lowest speed. This relationship was weaker at the faster speeds.

Conclusions: Whilst this study cannot imply that increases in eccentric strength caused improvement in function, some linear association existed, suggesting eccentric strength training is worthwhile in rehabilitating PFP. The pattern of the correlations suggests that it is more sensitive to assess strength at slower speeds.

SKATEBOARD INJURIES OF THE KNEE JOINT IN CHILDREN
M. Bhattacharyya. King George Hospital, Old Church Hospital England, 72 Haldane Road, Eastham, London, E6 3JN, UK

Skateboarding is gaining its popularity among the young and adolescent. Naturally epiphyseal injuries are causing concern. We aim to highlight the need for prevention and an intervention programme.

Method: Over a 24 month period there were 11 admissions to institutions because of skateboard injuries with fractures and cartilaginous injuries of the knee joint requiring surgical intervention.

Results: There were three cases of severe osseous injuries localised at the epiphyseal plate, five avulsion fractures of the intercondylar eminence, and one had fracture of the patella and two avulsions of the tibial tuberosity.

Discussion: The skateboard is an enjoyable toy with an acceptable risk of minor injury if not allowed near roads. Children under 10 years have a higher risk of fractures and head injuries due to insufficient motor development to control the boards and the resultant falls. Surgical intervention in this group requires considerable expertise. It could be associated with serious morbidity. Post traumatic deformity is the potential cause of long term disability. This study aims to report early recognition and a high level of expertise is paramount to achieve good results.

SPORTS MEDICINE TRAINING IN THE NETHERLANDS
A. Weir. Antoniushove Hospital, Leidschendam, The Hague, The Netherlands

In light of the recent recognition of sports and exercise medicine as a clinical specialty in the UK it is interesting to look at European neighbours who have established training schemes when considering the possibilities for future programmes in the UK.

In the Netherlands there has been a registrar training since 1976. This training was recognised by the Social Medical Registration Commission (SGRC) in 1991. There are currently around 120 qualified sports physicians in the Netherlands.

The registrar training takes four years. It comprises one year of orthopaedics and one year of cardiology. Following this basic training the registrar commences practice in a recognised sports medicine institute under supervision for around 18 months. A three month attachment in general practice is also compulsory.

Alongside the basic training registrars must also gain practical experience providing medical care for teams or events. There is also an ongoing exercise physiology curriculum with an entrance exam then practical workshops and courses followed by a practical period. The registrar must participate in scientific research and there are around 45 days of compulsory structured courses throughout the training.

My own background as a UK born and trained doctor gives me a unique insight into both systems and the poster would be of interest considering the recent developments.

CONSERVATIVE MANAGEMENT OF ACUTE ACHILLES TENDON RUPTURE BY A NEW PROTOCOL
M. Z. Sadiq, T. A. Syed, Y. Shah, D. A. Wallace. Milton Keynes General Hospital, Milton Keynes, UK

Aim: To assess the efficacy and results of managing acute achilles tendon rupture by an ultrasonography based protocol.

Method: We manage all cases of acute achilles tendon rupture by a new protocol. All patients with clinical rupture undergo ultrasonography with the foot in full equinus. Cases in which the ruptured ends of the tendon meet each other are managed conservatively while in cases, a gap remains between the ends are offered surgical repair. We managed 20 cases of acute achilles tendon rupture by conservative means since the introduction of this protocol in our department. These patients were followed up minimally for six months. The patients were assessed with a functional outcome questionnaire on pain, stiffness, return to work, and return to sporting activities.

Results: There was no case of re-rupture in the 6 months follow up. All the patients were highly satisfied and there was no functional disability.

Conclusion: Our results show that conservative management of acute achilles tendon rupture can have satisfactory outcome and decreased re-rupture rate when managed by our protocol. This method can be further modified by measuring the actual gap between the tendon ends and defining a minimal gap for conservative treatment.