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## OBESITY AND KNEE REPLACEMENT OUTCOME

Previously, the ideal indications for unicompartmental knee replacement (UKR) included, among other restrictions, a body mass of less than 82 kg. However, few studies have evaluated the impact of body mass index (BMI) on the long-term outcome of this surgery. This study further explored the effect of BMI on the outcome of knee replacement surgery.

This prospective, single center study included all patients undergoing UKR with a minimum of seven years follow-up. A total of 290 UKRs were performed in 254 patients between January of 1990 and December of 2004. Of these, 185 patients were contacted.

The mean BMI at the time of surgery was 27.9 kg/m<sup>2</sup> and the mean age was 66 years. The patients were divided into subgroups according to weight ( $\geq$  or  $<$  82 kg) and BMI ( $\geq$  or  $<$  30 kg/m<sup>2</sup>). The clinical outcome at the last follow-up was assessed using the Knee Society Score (KSS).

The mean follow-up was conducted at 11.6 years. The mean KSS score and the mean KSS function score were not significantly related to BMI ( $p=0.56$  and  $p=0.47$ , respectively). While weight played a role in reducing the risk of revision, this finding did not reach statistical significance ( $p=0.24$ ).

**Conclusion:** This retrospective study found that the 10-year survival rate and functional outcome of patients undergoing knee replacement does not differ between those who are obese and those who are not the time of surgery.

Cavaignac, E., et al. Obesity Has No Adverse Effect on the Outcome of Unicompartmental Knee Replacement at a Minimum Follow-Up of Seven Years. *Bone Joint J.* 2013, August; 95-B (8): 1064-1068.

## ANKLE BRACHIAL INDEX AND DEMENTIA

Several epidemiological studies have estimated the prevalence of peripheral artery disease (PAD) to be up to 25% after the age of 80 years. Several studies have also reported that PAD is associated with cognitive decline. This study was designed to determine the association between a low ankle brachial index (ABI) and the risk of prevalent dementia.

The Epidemiology of Dementia in Central Africa Study is a multicenter study using a cross-sectional survey of inhabitants 65 years of age or older in Central Africa. Cognition was screened with the Community Screening Interview for Dementia (CSI-D) and the Five-Words Test (FWT). All subjects underwent ABI assessment at the posterior tibial and dorsal pedis arteries bilaterally. PAD was defined as an ABI of 0.9 or less. A multivariate logistic regression was used to quantify the association between PAD and dementia.

Among the 1,016 subjects screened, the mean age was 73.4 years, with 28.1% found to have PAD. Of the total, 32.4% were cognitively impaired. Subjects with dementia were more often female, widowed and more likely to have depressive symptoms, less education and a lower body mass index. A significant association was found between PAD and prevalent dementia, even after adjusting for potential confounding factors ( $p=0.004$ ). The association was stronger with lower ABI values.

**Conclusion:** This study of elderly individuals in Africa found a significant association between prevalent peripheral artery disease and dementia in elderly individuals.

Guerchet, M., et al. Association between a Low Ankle Brachial Index and Dementia in a General, Elderly Population in Central Africa (Epidemiology of Dementia in Central

Africa Study). *J Am Geriatric Soc.* 2013, July; 61(7): 1135-1140.

## GLUCOSE LEVELS AND RISK OF DEMENTIA

Findings of studies assessing the association between obesity or diabetes and the risk of dementia have been mixed. This investigation further evaluated the association between glucose levels and the risk of dementia in the elderly population.

The Adult Changes in Thought (ACT) study initially included randomly selected, dementia free members of a healthcare system in Washington State. Participants were 65 years of age or older at enrollment and were invited to return at two-year intervals for cognitive testing with the Cognitive Abilities Screening Instrument. Clinical data included measurements of fasting glucose. Random measurements of glucose and glycated hemoglobin were captured from 1988 onward. The latter values were used to calculate average daily glucose, and then the association between glucose levels and new onset dementia.

The 2,067 participants completing the study averaged 76 years of age and were followed over a median of 6.8 years. Dementia developed in 524 of those 2,067 participants, including 26.1% of those without diabetes and 21.6% of those who did have diabetes at the conclusion of follow-up. The risk of dementia increased with increasing glucose levels, averaged over the previous five years, for both those with diabetes ( $p=0.002$ ) and those without diabetes ( $p=0.01$ ).

**Conclusion:** This study of elderly individuals found that elevated glucose levels may be a risk factor for dementia, even among patients without diabetes.

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Crane, P., et al. Glucose Levels and Risk of Dementia. *N Eng J Med.* 2013, August 8; 369(6): 540–548.

**AMANTADINE FOR SPORTS RELATED CONCUSSION**

Dopamine is known to strongly influence the frontal lobe, and is involved in the regulation of behavior, executive function, judgment, arousal and motor control. Limited evidence suggests that dopaminergic neurostimulants may facilitate recovery and quality of life for persons with brain injury. This study assessed the effect of amantadine on the symptoms and cognitive deficits of athletes following concussion.

Eligible subjects were college student athletes who had suffered a concussion, and who had failed to significantly improve after 21 days of rest. Following injury, all participants completed a clinical neuropsychological interview and the pretest ImpACT battery and symptom report. A treatment group received amantadine 100 mg twice per day, for three weeks, while a control group received no medication. Both groups were tested again with the ImpACT and symptom report at 40 to 50 days post-injury.

Both groups improved from pre-to post-testing, although the amantadine group demonstrated greater improvement than the control group in reported symptoms (p=0.005), verbal memory (p=0.009) and reaction time (p=0.05) performances.

**Conclusion:** This study of college athletes with delayed recovery from concussion found that treatment with amantadine can accelerate improvement in symptoms, verbal memory and reaction time.

Reddy, C., et al. Efficacy of Amantadine Treatment on Symptoms and Neurocognitive Performance among Adolescents following Sports-Related Concussion. *J Head Trauma Rehab.* 2013, July/August; 28(4): 260–265.

**UNITED STATES HEALTH, 1990 TO 2010**

The United States spends the most *per capita* on health care of all countries, but lags behind other high income nations in life expectancy and other health outcome measures. This report summarizes the burden of

diseases and injuries in the United States, and their evolution over the past two decades.

Results were obtained from the Global Burden of Disease (GBD), a collaborative effort involving 488 scientists from 50 countries. The GBD included descriptive epidemiology of 291 diseases and injuries, with key sequelae provided for each disease or injury. Metrics included health loss related to specific diseases, injuries and risk factors, as well as deaths, years of life lost to premature mortality, years lived with disability and disability adjusted life years. The data were reviewed for patterns and changes in patterns over the two decades prior to 2010.

Life expectancy increased in the United States from 75.2 years in 1990 to 78.2 years 2010. In 2010, those diseases with the largest number of years lived with disability included low back pain, major depressive disorder, other musculoskeletal disorders, neck pain and anxiety disorders. The largest cluster of risk factors involved the composition of diet, associated with 26% of deaths and 14% of disability adjusted life years. Tobacco remained the second leading risk factor, after diet. A body mass index of higher than 21 to 23 was the third ranked risk factor, associated with 14% of the deaths and 11% of disability adjusted life years.

**Conclusion:** This study demonstrates that even though life expectancy in the United States has increased in the past two decades, morbidity and chronic disability now account for nearly half of the health burden in the United States

U.S. Burden of Disease Collaborators. The State of U.S. Health, 1990–2010. Burden of Diseases, Injuries and Risk Factors. *JAMA.* 2013, August 14; 310(6): 591–608.

**ADOLESCENT DISPLACED CLAVICLE FRACTURES: SURGERY?**

While adult and adolescent midshaft clavicle fractures have historically been treated without surgery, recent studies in adults have suggested that surgical intervention may lead to increased function. This study evaluated the natural history of nonoperatively treated, displaced and

shortened clavicle fractures in adolescents.

Data were obtained from emergency room and fracture clinic records, identifying 155 patients treated for clavicle fracture between 2009 and 2011. Inclusion criteria were closed, 100% displaced midshaft clavicle fractures treated nonoperatively in patients between the ages of 10 and 18 years. Outcome assessments included the *QuickDASH* (Disabilities of the Arm, Shoulder and Hand), SANE (Single Assessment Numeric Evaluation) and Constant Shoulder Scores. The patients were followed for an average of 2.1 years.

Participants were 12 male and four female patients, with an average age of 14.2 years at the time of injury. At follow up the mean range of motion in the injured shoulder did not differ significantly from that of the contralateral uninjured shoulder. Compared with the uninjured side, internal rotation strength was 92.1%, external rotation strength 91.6%, abduction strength 97.9% and forward flexion strength was 106%. External rotation strength was significantly decreased (by 8.4%) on the injured side ( $p = 0.04$ ). These subjective measures of the *QuickDASH*, SANE and Constant scores were comparable between limbs. Fourteen of the 16 returned to their previous or a higher level of sports activity following injury.

**Conclusion:** This study of patients ten to 18 years of age found that conservative, nonoperative management of displaced midshaft clavicle fractures resulted in near-normal functional outcomes.

Schulz, J., et al. Functional and Radiographic Outcomes of Nonoperative Treatment of Displaced Adolescent Clavicle Fractures. *J Bone Joint Surg*. 2013, July 3; 95 (13): 1159-1165.

#### FAILURE-BASED DEPRESSION AMONG ELITE ATHLETES

An estimated 17.7% of the population will develop depressive disorders at some point in life. As depression affects function, this study investigated the prevalence of depression and its relationship to performance among elite athletes.

The study included 28 male and 22 female varsity swimmers at two Canadian universities, all engaged in

competitions for determining the Olympic and world championship teams. All subjects underwent a semi-structured interview based upon DSM-IV criteria, in order to establish a diagnosis of depression. In addition, the Beck Depression Inventory was used to assess depressive symptoms. Swimming performance was measured and was compared with the results of the depression assessments.

Before competition, 68% of the athletes met the criteria for a major depressive episode within the previous 36 months. After competition, 34% met the diagnostic criteria. More athletes who ranked in the top 25% of the performance group met the criteria for major depression, as compared to the bottom 75%. Among the top 25% of athletes, a significant relationship was seen between change in swimming performance and meeting the diagnostic criteria for depression ( $p = 0.03$ ).

**Conclusion:** This study of elite athletes suggests that the prevalence of depression is higher than that of the general population, and that being ranked higher seems to place the athlete at greater risk for performance-based depression.

Hammond, T., et al. The Prevalence of Failure-Based Depression among Elite Athletes. *Clin J Sports Med*. 2013, July; 23(4): 273-277.

#### STATIN TOXICITY WITH MACROLIDE COPRESCRIPTION

The U.S. Food and Drug Administration has recently issued cautions concerning the interaction between statins and the co-administration of CYP3A4 inhibitors, including erythromycin and clarithromycin. This study was designed to characterize the risk for statin toxicity in an elderly sample with such co-prescriptions.

This retrospective, cohort study collected data from four, linked national Canadian databases of adults older than age 65 years. The databases include information gathered from both inpatient and outpatient services regarding patient demographics, vital status information and diagnoses. The authors identified patients who were users of CYP3A4 metabolized statins and were co-prescribed clarithromycin, or erythromycin.

As azithromycin has indications and clinical use patterns similar to those of clarithromycin and erythromycin, but does not inhibit CYP3A4 or increase blood concentrations of CYP3A4-metabolized statins, this substance was used for comparison. For the first 30 days following initial macrolide use, the incidence of hospitalization with rhabdomyolysis, hyperkalemia, acute kidney insufficiency and all-cause mortality were identified.

Of the 144,336 patients included, simultaneous use of clarithromycin or erythromycin with CYP3A4 metabolized statin use was associated with an increased relative risk of hospitalization with rhabdomyolysis ( $rr=2.17$ ), acute kidney insufficiency ( $rr=1.78$ ), hyperkalemia ( $rr=11.04$ ) and 30-day, all-cause mortality ( $rr=1.56$ ) when compared with azithromycin co-prescription.

**Conclusion:** This study of patients over 65 years of age found that the co-prescription of atorvastatin, simvastatin or lovastatin with erythromycin or clarithromycin is associated with an increased risk of hospitalization with acute rhabdomyolysis, acute kidney injury and all-cause mortality.

Patel, A., et al. Statin Toxicity from Macrolide Antibiotic Co-Prescription. *Ann Intern Med*. 2013, June 18; 158 (12): 869-876.

#### ANTIHYPERTENSIVE MEDICATION USE AND COGNITIVE IMPAIRMENTS

Analysis from the Honolulu Asia Aging Study has estimated that 27% of dementia cases may be attributable to midlife systolic blood pressure of at least 120 mmHg among inadequately treated men. However, the effect of antihypertensive drug use in late life to prevent cognitive impairment remains unclear. This study examined the association between antihypertensive drug use and the risk of cognitive impairment in a large, prospective cohort of elderly Japanese-American men.

This prospective study included 3,374 Japanese-American men, followed since 1965 as part of the Honolulu Heart Program. At baseline examination, 3,734 men were evaluated with the Cognitive Abilities Screening Instrument (CASI).

Participating men were 71 to 93 years of age, representing 80% of the surviving cohort. The primary outcome measures were cognitive impairment, defined as a CASI score of less than 74, and cognitive decline, defined as at least a nine-point decrease in CASI score. These outcomes were compared with blood pressure control and medication use.

During a median follow-up of 5.8 years, 38.9% developed cognitive impairment. The use of beta blockers as the sole antihypertensive medication was associated with a lower risk of cognitive impairment, as compared with that for untreated men. Diuretics, ACE inhibitors, calcium channel blockers, vasodilators and drug combinations including a beta blocker were not associated with the development of cognitive impairment. Cognitive decline occurred in 53.1% of the men, with beta blocker use associated with a trend towards a decreased risk of cognitive decline. None of the other drug categories was associated with cognitive decline.

**Conclusion:** This prospective study of Japanese-American men found that the use of a beta blocker for blood pressure control is associated with reduced risk of cognitive impairment or cognitive decline.

Gelber, R., et al. Antihypertensive Medication Use and Risk of Cognitive Impairment. The Honolulu – Asia Aging Study. *Neurol.* 2013, Sept 3; 81: 1-8. DOI: 10.1212/WNL.0b013e3182a351d4

### BLOOD PRESSURE TARGETS AFTER RECENT LACUNAR STROKE

Hypertension is among the most relevant risk factors for stroke, particularly those associated with cerebral small vessel disease. Whether there are optimal blood pressure targets to prevent stroke recurrence in patients with cerebral small artery disease is not yet known. This study was designed to determine the effects of a target range systolic blood pressure on the rate of stroke recurrence.

This randomized, multicenter, clinical trial included patients 30 years or older with a recent lacunar stroke. Patients were randomized to one of two systolic blood pressure control groups with targets of 130 to 139

mmHg or below 130 mmHg, with randomization occurring at least two weeks after the stroke. The primary endpoint was a reduction in all strokes.

The 3,020 participants were followed for a mean of 3.7 years. The median time from qualifying stroke to randomization was 62 days. At one year follow-up, 1,139 of the higher target group (75%) and 976 of the lower target group (65%) had blood pressures within the assigned target ranges. The annualized rate of recurrent stroke in the higher target group was 2.77%, while that in the lower target group was 2.25% ( $p=0.08$ ). A 13% reduction in the rate of recurrent lacunar stroke was seen in the lower target group. Among those classified as hypertensive at study entry, a 20% reduction in recurrent stroke was seen in the lower target group.

**Conclusion:** This study of patients with acute lacunar stroke found that lowering the systolic blood pressure target to less than 130 mmHg resulted in a nonsignificant reduction in all strokes.

The SPS3 Study Group. Blood Pressure Targets in Patients with Recent Lacunar Stroke: The SPS3 Randomised Trial. *Lancet.* 2013, August 10; 382(9891): 507- 514.

### HEPARIN IN ACUTE SPINAL CORD INJURY

Venous thromboembolism (VTE), including both deep venous thrombosis and pulmonary embolism, is a major cause of mortality among patients with acute spinal cord injury (SCI). Pharmacological interventions with both unfractionated heparin and low molecular weight heparin are commonly employed to address this problem. This study was designed to clarify the effect of different dosing and different molecular weights of heparin for thromboprophylaxis in patients with acute SCI.

This meta-analysis included articles obtained through a systematic literature review of the MEDLINE database, including articles published up to February of 2013. From that search, 18, randomized, controlled trials were identified, including 2,578 patients with studies comparing heparin-based intervention for SCI.

On meta-analysis, no significant difference was noted in the incidence of total DVT between those treated

with low dose unfractionated heparin versus low molecular weight heparin ( $p=0.163$ ). A decreased incidence of bleeding was observed with low molecular weight heparin dosing, compared to unfractionated heparin ( $p=0.04$ ). No significant effect on the incidence of VTE was found between low dose unfractionated heparin, placebo and no treatment ( $p=0.173$ ).

**Conclusion:** This meta-analysis did not find a significant difference in the total number of venous thromboembolic events between those treated with low-dose unfractionated heparin and those treated with low molecular weight heparin.

Chen, H., et al. Heparin for Venous Thromboembolism Prophylaxis in Patients with Acute Spinal Cord Injury: A Systematic Review and Meta-Analysis. *Spinal Cord.* 2013, August; 51: 596-602.

### ASSOCIATION BETWEEN SMOKING AND MULTIPLE SCLEROSIS

The etiology of multiple sclerosis (MS) remains elusive, with recent data suggesting that tobacco abuse is associated with increased susceptibility. This Canadian study further investigated whether smoking was associated with MS risk in a large Canadian sample, as well as the effects of maternal smoking and passive smoking exposure during pregnancy.

This retrospective study utilized data from the longitudinal Canadian Collaborative Project on Genetic Susceptibility to Multiple Sclerosis (CCPGSMS), with data obtained between January 1, 2008, and June 30, 2011. All MS patients and their spouses (controls) were asked about their lifetime smoking, including exposure to passive smoking. In addition the patients' mothers were asked 1) while pregnant with the patient or control, did you ever smoke cigarettes, and 2) while pregnant did anyone in the household ever smoke cigarettes regularly inside the house?

Patients with MS were more likely to have ever smoked than were controls, with an odds ratio of 1.32 ( $p=0.003$ ). Among males with MS, 71.5% smoked, as compared to 59.1% of controls. However, 63.6% of female patients with MS smoked, as compared to 63% of controls ( $p=0.82$ ). Among never smokers

there was no association between household or workplace smoke and the risk of MS. No association was found between active or passive smoking history in mothers of MS patients when adjusted for age. Smoking exposure during pregnancy was not associated with an increased risk of MS among offspring.

**Conclusion:** This study found an association between tobacco abuse and the risk of MS, consistent with previous reports. There was no significant association between MS and maternal smoking, maternal smoke exposure during pregnancy or passive smoke exposure.

Ramagopalan, S., et al. Association of Smoking with Risk of Multiple Sclerosis: A Population-Based Study. *J Neuro*. 2013, July; 260(7): 1778-1781.

#### ARTHRITIS AND ALCOHOL CONSUMPTION

Though a number of genetic risk factors for rheumatoid arthritis (RA) have been identified, the only environmental risk factor consistently associated with this disease is tobacco abuse. A possible association between alcohol consumption and RA has been reported in previous studies, with conflicting results. This study further investigated that association.

This study used data from the Leiden Early Arthritis Clinic, initiated in 1993. That study included adult patients, presenting between 1993 and 2008 with a definite diagnosis of osteoarthritis (OA), or RA, ReA, SpA or PsA. Demographic characteristics, autoantibodies, sedimentation rates, C reactive protein and the number of HLA SE alleles were determined at baseline. A control sample was obtained from the general population. Alcohol consumption and tobacco abuse was recorded at baseline for both groups through an interview by a trained research nurse.

Multivariate logistic regression analysis revealed an inverse association between alcohol consumption and the presence of all forms of arthritis, including RA and OA. The inverse association between alcohol and RA was greater in men than in women. The level of ESR was inversely correlated with the proportion of patients consuming alcohol ( $p < 0.001$ ). No significant association was found between

alcohol consumption and rate of joint destruction.

**Conclusion:** This study found an inverse relationship between alcohol consumption and arthritis, regardless of the type of arthritis.

Huidekoper, A., et al. Patients with Early Arthritis Consume Less Alcohol than Controls, Regardless of the Type of Arthritis. *Rheum*. 2013, Sept; 52(9): 1701-1707.

#### SPORTS INJURIES IN CHILDREN VERSUS ADOLESCENTS

Participation in competitive youth athletics has grown steadily over the past four decades. However, limited data exist thus far regarding characteristics of sports related injuries sustained by young children. This study sought to describe sports injuries in young athletes, and to compared them to those of adolescents.

This retrospective study included 2,133 cases collected between 2000 and 2009 at the division of sports medicine at a large academic, pediatric medical center. Patients ranged from five to 17 years of age, with 28% in the five- to 12-year-old range, and 72% in the 13- to 17-year-old group. Injury mechanisms and location of injury were documented. Treatment was categorized as physical therapy, surgery, cast, brace, rest, medicine or bone stimulator.

The site of injury differed significantly by age, with younger patients more likely to have upper extremity injuries and older ones more likely to be seen for head, chest, hip/pelvic or spinal injuries. Approximately half of the younger patients were treated for overuse injuries, while older patients were disproportionately treated for overuse injuries, as opposed to traumatic injuries.

The older group sustained more anterior cruciate ligament and meniscal tears, as well as spondylolysis. The fracture rate was highest in boys, with 17.2% requiring surgery. Spondylolysis accounted for the majority of spine injuries in both groups, with 75.8% of those seen among females.

**Conclusion:** This study of patients seen at one pediatric clinic found that half of the injuries were overuse injuries, with 40% of the injuries requiring surgery. Younger

children sustained more traumatic bony fractures of the upper extremity.

Stracciolini, A., et al. Pediatric Sports Injuries. An Age Comparison in Children versus Adolescents. *Am J Sports Med*. 2013, August; 41(8): 1922-1929.

#### FLUID ASSOCIATED WITH THE ILIOTIBIAL BAND SYNDROME IN ASYMPTOMATIC RUNNERS

Iliotibial band syndrome (ITBS) affects up to 12% runners during some point during their careers. Among the imaging findings associated with this syndrome is a finding of fluid deep to the ITB. This study evaluated the prevalence and distribution of fluid associated with ITB in a high-risk population of asymptomatic recreational runners.

Subjects included five male and 15 female asymptomatic, recreational runners, recruited from a local fitness center. The runners, ages 18 to 40 years, reported running 10 to 30 miles per week. Bilateral ITB ultrasound examinations at the lateral femoral epicondyle region were performed by the senior investigator. Scans were conducted with the knee in complete extension and at 30° flexion, with the subject in both a supine and weight-bearing position.

Fluid was observed in 100% of the subjects in at least one position of at least one knee. All subjects had fluid in the right knee in at least one position, and 18 of 20 subjects had fluid present in the left knee in at least one position. In a supine, non-weightbearing position, with the knee in full extension, fluid was present in 67.5% of the knees, while, in the flex position, fluid was present in only 30% of the knees. Finally, in the weight-bearing position, within the knee flexed to 30°, fluid was present in only 22.5% of the knees.

**Conclusion:** This study of asymptomatic runners found that fluid is associated with iliotibial band syndrome in 100% of the runners and is bilateral in 90%.

Jeising, E., et al. The Prevalence of Fluid Associated with Iliotibial Band in Asymptomatic Recreational Runners: An Ultrasonographic Study. *PM&R*. 2013, July; 5(7): 563-567.

## HEAD AND NECK INJURIES IN PROFESSIONAL SOCCER PLAYERS

Head injuries are reported to account for four to 22% of all injuries in soccer, with neck injuries less frequent. This study was designed to determine the head and neck injury rate in male, professional soccer players in Europe, and to establish player characteristics related to these injuries.

Data were obtained from a prospective, cohort study, evaluating professional soccer in Europe over the years 2001 to 2010. From 26 clubs in 10 countries, 1,401 first-team players were followed. All underwent anthropometric and player position assessment. Injuries sustained during training or match play were prospectively identified, with injury rates calculated as the number per 1,000-hour exposure.

Over 797,389 exposure hours, a total of 6,140 time loss injuries were reported. The head and neck injury rate was 0.17 injuries per 1,000 hours. Head injuries were significantly more common than neck injuries, with concussions the most frequent of those. The mean number of days off play was 11, with 27% of players who sustained a concussion returning within five days. Defenders were more likely to sustain head and neck injuries, although a multivariate analysis found no significant player- or match-related variable identifying an increased risk of concussion.

**Conclusion:** This study of elite soccer players found that head and neck injuries are uncommon among these athletes, with defenders at highest risk position for sustaining these injuries.

Nilsson, M., et al. Head and Neck Injuries in Professional Soccer. *Clin J Sports Med.* 2013, July; 23(4): 255-260.

## AUTOLOGOUS BLOOD INJECTIONS FOR PLANTAR FASCIITIS

Plantar fasciitis is a common condition, often treated with conservative modalities including rest, stretching, ice, splints and corticosteroid injections. Though often successful, some patients continue to experience chronic pain. As autologous blood injections (ABI) have been used to treat a range of tendon disorders, this study

examined the efficacy of ABI for the treatment of recalcitrant plantar fasciitis.

This study included 35 patients with refractory plantar fasciitis. All received an ultrasound guided injection of 4 mL of whole autologous blood at the site of the pain. Following injection, the subjects were provided individual home exercises involving stretching of the planter fascia, calf and hamstrings. Participants were assessed at regular follow-up intervals with the visual analogue scale (VAS) for pain and a seven-point Likert scale for satisfaction.

At baseline, the patients reported a mean VAS score of 8/10. Following the procedure, the mean VAS score was 1.1, an 86.7% decrease in pain. At the final follow-up appointment, 53% were pain free and 70% indicated that they were extremely satisfied or very satisfied.

**Conclusion:** This study of patients with chronic plantar fasciitis found that ultrasound guided autologous blood injections with a home stretching program may be effective in reducing pain and increasing satisfaction.

Wheeler, P., et al. Autologous Blood Injections for Chronic Plantar Fasciitis: A Pilot Case Series Study Shows Promising Results. *Intern Musculoskel Med.* 2013, April; 35(1): 3-7.

## ABILITY TO SELF-REPORT PAIN AFTER STROKE

Following a stroke, assessment of pain is most often performed by self-report. The frequency of an inability to self-report pain after stroke has not been previously assessed in a population-based sample. This study assessed the frequency and factors associated with inability to report pain after a stroke.

This retrospective, cohort study included 388 individuals with a median age of 77 years and with an acute ischemic or hemorrhagic stroke. The Faces Pain Scale (FPS) and Numerical Rating Scale (NRS) were utilized to obtain patients' self-reports of pain during admission and then at least twice daily.

Of the individual studied, 336 were able to self-report pain upon admission, while 52 (13.4%) were unable to provide a meaningful response to either the FPS or the NRS on admission. The inability to report pain on admission was

significantly associated with stroke severity, as measured by NIHSS ( $p < 0.001$ ) and ICH scores ( $p < 0.001$ ).

The inability to self-report pain upon hospital admission was significantly associated with death during hospitalization (46.2% of those unable, versus 4.8% of those able,  $p < 0.0001$ ). Of those able to self-report, 27.7% reported some pain at the time of admission, with 62.2% reporting some pain during hospitalization.

**Conclusion:** This study found the inability to report pain upon hospital admission for stroke occurred in 13.4% of admissions, with this inability associated with death during hospitalization.

Smith, J., et al. Inability to Self-Report Pain After a Stroke: A Population-Based Study. *Pain.* 2013, August; 154(8): 1281-1286.

## SUBTHALAMIC DEEP BRAIN STIMULATION AND COGNITION IN PARKINSON'S DISEASE

While bilateral, subthalamic deep brain stimulation (STN DBS) is an established treatment for motor symptoms of Parkinson's disease (PD), the effect of this intervention on cognition remains controversial. This study assessed the effect of this treatment on cognition within the first six months post-surgery.

This prospective study included patients with PD who underwent bilateral STN DBS implantation, and were followed for at least 36 months after surgery. Before and after surgery, all patients were assessed with the Unified Parkinson's Disease Rating Scale (UPDRS), for levodopa equivalent daily dose (LEDD) and with neuropsychological testing. Global cognitive function was assessed using the Mini Mental Status Exam (MMSE). Patients were excluded if they had a preoperative MMSE score of less than 25, a repositioning of electrodes within three years, staged bilateral surgery or missing follow-up MMSE scores.

Thirty-six patients were enrolled. The mean change in MMSE scores from baseline to six months was greater than the change from six months to 36 months ( $p = 0.015$ ). Baseline LEDD ( $p = 0.005$ ) and the axial subscore of the off-UPDRS motor score ( $p = 0.023$ ) were significantly related to the change in MMSE score during the first six months.

**Conclusion:** This study of patients with Parkinson's disease, undergoing sub-thalamic deep brain stimulation, found a rapid decline in global cognitive function six months after surgery as compared to the period of six months to three years.

Kim, H., et al. Initial Cognitive Dip after Sub-Thalamic Deep Brain Stimulation in Parkinson's Disease. *J Neurol*. 2013, August; 260(8): 2130-2133.

### PREDICTING OSTEOARTHRITIS

Osteoarthritis (OA), worldwide, affects approximately 10% of men and 18% of women over the age of 60 years. This meta-analysis was designed to identify modifiable risk factors associated with the onset of OA.

The literature search included 12 databases, reviewing for papers concerning overweight/obesity, joint injury, physical activity, sport activity and/or occupational activity as a potential OA risk factors. Outcomes of interest included OA of the hip, knee and/or ankle. A total of 1,294 studies were identified through title review, with 43 selected for inclusion in the meta-analysis. Of those, 10 were cross-sectional, 12 were case-control, 17 were cohort, two were longitudinal, and two were case designs.

Risk factors for both knee and hip OA included previous injury and meniscectomy. Sport activity studies failed to reach reliable conclusions. Physical activity did not have a clear benefit or risk. Obesity was found to be a risk factor for hip or knee OA with increasing BMI. Occupations with increased physical demands were associated with increased risk of developing hip or knee OA.

**Conclusion:** This meta-analysis found a clear relationship between hip and knee OA for subjects with previous injury, those who were overweight or obese, or those whose occupations involved increased physical demands.

Richmond, S., et al. Are Joint Injury, Sport Activity, Physical Activity, Obesity, or Occupational Activities Predictors for Osteoarthritis? A Systematic Review. *J Orthopedic Sports PT*. 2013, August; 43(8): 515-524.

### FLEXION OF THE KNEE IN OSTEOARTHRITIS

Approximately 2.5% of the adult population suffers from osteoarthritis (OA) of the hip or knee, with symptoms including pain and functional limitations. As biomechanics play an important role in the progression of knee OA, this study was designed to determine whether gait analysis may be assistive in diagnosing early OA.

This case control study included 44 participants, 23 diagnosed with knee OA. A gait profile was determined using inertial sensors and gyroscopes, accelerometers and a memory storage card mounted on the lower extremities. Data analysis included knee flexion range of motion during stance phase, swing phase and overall stride time. These findings were compared between those with and those without OA of the knee.

A significantly greater decrease in knee flexion range of motion during stance and swing phase was observed in the OA group as compared to the controls. While those with OA walked slower, this difference did not reach statistical significance.

**Conclusion:** This study, comparing those with versus without OA of the knee, found that knee flexion range of motion during stance loading is reduced among patients with OA as compared with normal controls.

McCarthy, I., et al. Analysis of Knee Flexion Characteristics and How They Alter with the Onset of Knee Osteoarthritis: A Case Control Study. *BMC Musc Disorders*. 2013, May; 14: 169.

### ULTRASOUND TO DIAGNOSE CHRONIC EXERTIONAL COMPARTMENT SYNDROME

Chronic exertional compartment syndrome (CECS) is thought to occur in 14 to 27% of patients with undiagnosed exertional leg pain. This condition often occurs in athletes after exercise, most commonly in the anterior compartment of the leg. This study assessed whether ultrasound (US) may be useful in diagnosing CECS.

Participants were four individuals who met the clinical criteria for CECS and nine control subjects. Compartmental pressure testing was

performed at rest and then at one, three and five minutes after a treadmill exercise protocol designed to induce symptoms of CECS. Pressures were measured directly at 10 cm distal to the tibial tubercle and 1.5 cm lateral to the anterior tibial crest. US was used to measure anterior compartment thickness (ACT), comparing subjects with CECS with controls.

A statistically significant difference was not found in mean ACT in patients with CECS versus control subjects at rest. However, the difference was significant at 0.5 minutes, 2.5 minutes and 4.5 minutes after exertion ( $p=0.003$ ). The mean percentage change in ACT from rest in patients with CECS versus control subjects was significantly different at 0.5 minutes ( $p=0.011$ ), 2.5 minutes and 4.5 minutes ( $p=0.003$ ) after exertion.

**Conclusion:** This study of patients with chronic exertional compartment syndrome suggests that ultrasound may be a useful diagnostic tool for this disorder.

Rajasekaran, S., et al. The Utility of Ultrasound in Detecting Anterior Compartment Syndrome Changes in Chronic Exertional Compartment Syndrome: A Pilot Study. *Clin J Sport Med*. 2013, July; 23(4): 305-311.

### INTERMITTENT PNEUMATIC COMPRESSION AFTER STROKE

Following stroke, patients are at increased risk for venous thromboembolism, including deep vein thrombosis (DVT). Prophylaxis with anti-thrombotic drugs or physical methods such as intermittent pneumatic compression (IPC) have been shown to reduce the risk of DVT, although the balance of risk and benefit for these approaches is unclear. This study was designed to determine whether the routine application of IPC to the legs of patients with recent stroke can reduce the risk of DVT.

This multicenter, parallel group trial included 2,876 patients admitted within three days of an acute stroke. The subjects were randomized to a treatment group to receive IPC or to a control group, without IPC. The IPC devices were worn continuously, except during washing, therapy, or screening compression duplex ultrasound. A technician who was held blind to the treatment allocation

(Continued from page 2)

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completed compression duplex ultrasounds of both legs at 7 to 10 days, and at 25 to 30 days, after enrollment. The primary outcome measure was symptomatic or asymptomatic DVT in the proximal veins.

Of the 2,876 patients enrolled, 1,438 were randomly assigned to receive IPC, and 1,438 to receive no IPC. The mean duration of IPC placement was 12.5 days. The primary outcome variable occurred in 8.5% of the patients allocated to IPC and in 12.1% of those allocated to the control group ( $p=0.001$ ). Fewer deaths from all causes were noted in the IPC group, although this finding did not reach statistical significance.

**Conclusion:** This randomized trial of patients with acute stroke found that intermittent pneumatic compression devices can significantly reduce the risk of deep vein thrombosis.

CLOTS. The Effectiveness of Intermittent Pneumatic Compression and Reduction of Risk of Deep Vein Thrombosis in Patients Who Have Had a Stroke (CLOTS): A Multicentre, Randomized, Controlled Trial. *Lancet*. 2013, August 10; 382(9891): 516-524.

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