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SUBARACHNOID HEMORRHAGE AND POSTTRAUMATIC STRESS DISORDER

Patients who survive a spontaneous subarachnoid hemorrhage (SAH) can experience a poor psychosocial outcome. One problem commonly seen in patients with SAH is that their recovery may be hampered by fear of another bleed. As the rate of recurrence is actually small, physicians typically advise patients that they are safe and should return to a normal, unrestricted life. This study examined the hypothesis that fear in patients with SAH is related to posttraumatic stress disorder (PTSD).

This study included a convenience sample recruited from follow-up studies of patients with SAH. In one study, the patients were assessed at 13 months post-SAH, while in a second study assessment was performed at 18 months post-SAH. At follow-up, the Posttraumatic Stress Diagnostic Scale was used to screen for a diagnosis of PTSD. The patients were also assessed for fear of a recurrence of SAH and of the occurrence of Parkinson's disease, lung cancer, and heart attack, comparing patients with PTSD and those without. These data were used to assess how likely the subjects believed that they versus an average person of the same age and gender would experience those conditions.

A total of 82 patients were recruited for sample one, and 60 for sample two. The diagnosis of PTSD was made in 34.1% of sample one and 36.7% of sample two. Those patients with PTSD were significantly more fearful of experiencing a future SAH than were those without PTSD ($p < 0.01$), with 32.1% of those with PTSD reporting being extremely fearful of recurrence of SAH. SAH patients with PTSD were also more fearful of developing lung cancer ($p < 0.01$) and a heart attack ($p < 0.001$) compared to those without PTSD.

Patients with PTSD reported reassurance from their health professionals ($p < 0.05$), follow-up appointments ($p < 0.05$) and learning more about SAH and its treatments ($p < 0.005$) to be significantly less helpful for increasing their confidence about not having another SAH than did patients without PTSD.

Conclusion: This study demonstrates that the fear of recurrence of SAH is related to the development of PTSD in this patient population.

Noble, A., et al. Subarachnoid Hemorrhage Patients' Fears of Recurrence Are Related to the Presence of Posttraumatic Stress Disorder. *Neurosurg.* 2011, August; 69(2): 323-333.

VASOSPASM AFTER SUBARACHNOID HEMORRHAGE AND ANEURYSM CLIPPING

The average mortality rate after subarachnoid hemorrhage (SAH) has been estimated to be approximately 50%, with one third of survivors needing lifelong supportive care. Vasospasm is the major cause of morbidity and mortality if the patient survives the initial bleeding event. It is well known that vasoreactivity is decreased elderly patients, leading to the hypothesis that the incidence of vasospasm and associated ischemic changes may be lower in this population. This study investigated the relative incidence of vasospasm, as well as associated delayed ischemic neurologic deficits, in an elderly sample.

This study included patients with intracranial aneurysms, identified retrospectively between 1989 and 1996, and prospectively between 1997 and 2004. Patients with traumatic and nonaneurysmal SAH did not enter the database. Subjects were 758 patients with aneurysmal SAH and neurosurgical clipping or

neuroradiological coiling. Data gathered included clinical presentation, Hunt and Hess scores, Fisher grade, location of the aneurysm, incidence of vasospasm, vasospasm associated neurologic deficits, ischemic findings, blood flow velocities, as defined by continuous transcranial Doppler (TCD) from day one day 14 after SAH and outcome.

Diagnostic imaging in 741 patients revealed 942 aneurysms. Most of the aneurysms were located at the anterior communicating artery and middle cerebral artery. Neuroradiological intervention and aneurysm surgery were performed in 39 and 702 patients, respectively. Post-hemorrhagic vasospasm was found in 55.2% of subjects under 60 years of age and in 25.7% of subjects 60 years of age or older ($p < 0.001$). Vasospasm induced ischemia was found in 6.7% of patients under 60 years of age and in 3.6% of those 60 years of age or older ($p = 0.06$).

Conclusion: This study of patients with aneurysmal SAH found that those 60 years of age or older have a lower incidence of vasospasm and vasospasm related ischemia than do younger patients.

Wachter, D., et al. Lower Incidence of Transcranial Doppler and Symptomatic Vasospasm after Aneurysmal Subarachnoid Hemorrhage and Aneurysm Clipping in the Elderly Patient? *Neurosurg.* 2011, August; 69(2): 261-267.

INJECTION VOLUME AND DISC DEGENERATION

Degenerative disc disease is strongly associated with back pain. Recent advances in molecular biology and biomaterials have enabled the development of degenerative disc biotherapies, including protein treatment, cell therapy and gene therapy. As these therapies are delivered using a

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syringe, some studies have indicated that percutaneous needle puncture may itself induce this degeneration. This study was designed to determine whether the volume of injectate is related to the onset of intervertebral disc degeneration.

This animal study included 180 rats, randomized into five groups for injection with various volumes of phosphate buffered saline (PBS). These included one, two, 2.5, or 3.0 μL . All injections were placed into the tail discs between the seventh and eighth vertebrae and between the eighth and ninth vertebrae. Caudal disc radiographs were taken at one, two and four weeks post-injection. Intervertebral disc (IVD) heights were measured and expressed as the disc height index (DHI). The animals were subdivided into groups for sacrifice at one, two or four weeks after the injection. In each subgroup, four tails (eight discs) were used for histologic analysis, and eight tails (16 discs) for biochemical analysis.

No significant differences were observed in the two smaller volume groups in DHI at weeks two and four. However, in the 2.5 and 3.0 μL groups, significantly greater disc space narrowing was seen at weeks two and four, as compared with the control group. Disc height narrowing was more severe in the 3.0 μL group than in the 2.5 μL group at both weeks two and four.

No significant differences in s-GAG content (one of the earliest changes during disc degeneration) were seen at any sample time between the control group and either the one or two μL groups. However, a significantly greater decrease in s-GAG was found at weeks two and four in the 2.5 and 3.0 μL groups than in the controls. In addition, histologic grading scale scores demonstrated deterioration in the 2.5 and the 3.0 μL groups at weeks two and four, with the larger volume group demonstrating deterioration as early as week one.

Conclusion: This animal study suggests that larger volumes of injectate into intervertebral discs may induce disc degeneration.

Mao, H., et al. The Effect of Injection Volumes on Disc Degeneration in the Rat Tail Model. *Spine*. 2011, July 15; 36(16): E1062-1069.

INTERSECTION SYNDROME MANAGED BY TAPING

The intersection syndrome is an overuse injury affecting the forearm. People with this syndrome report pain, crepitus and/or swelling in the distal forearm, at four to eight cm. proximal to Lister's tubercle. Current management of this syndrome includes a combination of rest, nonsteroidal anti-inflammatory drugs (NSAIDs) and splinting. This pilot study explored the efficacy of taping in the management of this syndrome.

Five female patients diagnosed with intersection syndrome were recruited for this study. Treatment included the placement of a 50 mm. wide non-stretch sports tape beginning at the muscle bellies of the abductor pollicis longus and the extensor pollicis brevis, and applied with tension force directed in the ulnar direction across the dorsal aspect of the forearm. This treatment was repeated daily for three weeks. Assessments were completed at baseline and at one, two, three and four weeks, and then again at one year after treatment.

All five patients reported that crepitus, pain over the forearm and swelling were no longer present at three-week follow-up. In addition, considerable improvement was seen in upper limb function at three and four weeks among all patients, as measured by changes in Disability of the Arm, Shoulder and Hand questionnaire (DASH-JSSH) scores. All patients maintained pain free, normal upper limb function at one-year follow-up.

Conclusion: This small pilot study of patients diagnosed with the intersection syndrome suggests that taping may be an effective treatment strategy.

Kaneko, S., et al. Forearm Pain, Diagnosed as Intersection Syndrome, Managed by Taping: A Case-Series. *J Orthop Sport Phys Ther*. 2011, July; 71(7) 514-519.

SUBCORACOID IMPINGEMENT SYNDROME

Pain in the shoulder related to contact between the anterior cuff and coracoid process was first described in 1909. Since then, subcoracoid impingement has been increasingly recognized as a cause of anterior

shoulder pain. This study analyzed the characteristics of patients surgically treated for this condition.

This investigation included 13 consecutive patients diagnosed with subcoracoid impingement who underwent arthroscopic treatment. These subjects were identified from among a database of 1,678 consecutive patients treated with shoulder problems over a period of three years. All participants were followed for one year after surgery by an independent physician, with clinical and shoulder scores obtained at follow-up.

Surgery consisted of a coracoplasty in two patients, a combination coracoplasty and acromioplasty in two patients, a coracoplasty and subscapularis tendon repair in four patients and only minor surgical correction of shoulder instability in five patients. The subjects were assessed with the Constant rating score, the University of California at Los Angeles (UCLA) score and the Simple Shoulder Test (SST). Pain was recorded using a ten-point Visual Analogue Scale (VAS).

At one-year follow-up, VAS scores decreased significantly from a mean pre-operative value of 7.7 points to mean of 1.2 points. At final follow-up, significant improvement was noted in scores on the UCLA, the Constant, and SST. Range of motion improved significantly ($p < 0.001$) in all planes measured.

Conclusion: This pilot study of patients diagnosed with subcoracoid syndrome found that surgical intervention may significantly improve pain and function.

Garafalo, R., et al. Subcoracoid Impingement Syndrome: A Painful Shoulder Condition Related to Different Pathological Factors. *Musculoskel Surg*. 2011 DOI 10.1007/s12306-011-0142-7.

LIFESTYLE AND LONG-TERM WEIGHT GAIN

As obesity has been linked to multiple medical comorbidities, the prevention of weight gain has been established as a health priority. Most weight gain occurs gradually, at about one pound per year, making it difficult for people to identify specific causes. This study was designed to investigate which lifestyle factors influence weight gain.

This study included data from several large, prospective trials. These included the Nurses' Health Study (NHS), a prospective study of a cohort of 121,701 female registered nurses from 11 U.S. states who were enrolled in 1976, The Nurses' Health Study II (NHS II), a prospective study of a cohort of 116,686 younger female registered nurses from 14 states who were enrolled in 1989 and The Health Professionals Follow-up Study (HPFS), a prospective study of 51,529 male health professionals from all 50 states, enrolled in 1986.

Participants were followed with biennial questionnaires for information about medical history, lifestyle and health practices. Exclusion criteria included diabetes, obesity, cancer, and cardiovascular, pulmonary, and renal or liver disease at baseline. Lifestyle habits monitored included physical activity, television watching, alcohol use, sleep duration and diet. Weight was evaluated every four years. Relationships between changes in lifestyle habits and weight gain were adjusted for age and baseline body mass index at each of the follow-up periods.

The final analyses included 50,422 women in the NHS, 47,898 women in the NHS II and 22,557 men in the HPFS. Those factors with the largest positive association with weight change, per serving per day, were increases in the consumption of potato chips, potatoes, sugar sweetened beverages, unprocessed meats and processed meats. Analyzing potato subtypes, the most significant gains were among those increasing consumption of French fries. Inverse associations with weight gain per serving per day were seen for increased consumption of vegetables, whole grains, fruits, nuts and yogurt.

Across quintiles, participants with greater increases in physical activity gained 1.76 fewer pounds within each four-year period. Sleep duration had a U-shaped association with weight gain, with greater weight gain occurring with less than six hours or more than eight hours of sleep per night. Increases in time spent watching television were independently associated with weight gain. As compared with persons who never smoked, those who had quit smoking within the previous four years had a weight gain of 5.17 pounds. Subsequent weight gain for former smokers was small.

Conclusion: This prospective study found specific dietary and lifestyle factors which are independently associated with long-term weight gain or weight loss. Weight gain was most strongly associated with increased consumption of potatoes, especially potato chips and French fries, with weight loss strongly associated with increased physical activity.

Mozaffarian, D., et al. Changes In Diet and Lifestyle and Long-Term Weight Gain in Women and Men. *N Engl J Med* 2011. June 23; 364(25): 2392-2404.

DOXYCYCLINE AND KNEE OSTEOARTHRITIS

Osteoarthritis (OA) of the knee is a common condition in clinical practice. The search for a disease-modifying osteoarthritis drug (DMOAD) for OA has intensified in recent years. Previous research has suggested that doxycycline may have disease modifying properties, although its role in symptom modification has not been well established. This study was designed to explore the effects of doxycycline on the symptoms of knee OA.

This randomized, double-blind, placebo-controlled trial included 232 patients who met the clinical and radiological criteria for OA of the knee. The subjects were randomized to receive either 100 mg of oral doxycycline or a placebo, twice per day for 24 weeks. The participants were assessed in the outpatient clinic at baseline, at weeks 12 and 24 and by telephone at weeks six and 18. Baseline characteristics were recorded, including radiographs, demographics, duration of complaints and previous treatments.

Questionnaires were administered to estimate OA related symptoms, quality of life, patient global assessment, changes in medications and adverse events. The primary outcome measure was the difference in the proportion of participants in both groups achieving a clinical response at week 24. Secondary outcome measures included WOMAC subscale scores for pain, stiffness and function, visual analog scale scores for patient global assessment and measures of quality of life.

Among the 232 subjects, 204 completed the trial protocol. A total of

72 of the 232 met the criteria for treatment response at the final study visit, including 27% in the doxycycline group and 35% in the placebo group ($p=0.2$). No significant differences were noted between groups on any of the secondary outcome measures. Significantly more participants in the doxycycline group discontinued the study medication prematurely than did those in the placebo group ($p=0.001$).

Conclusion: This study of patients with osteoarthritis of the knee did not find that doxycycline, a proposed disease modifying osteoarthritis drug, positively affects symptoms of that disorder.

Snijders, G., et al. Effects of Doxycycline on Reducing Symptoms in the Osteoarthritis: Results from a Triple-Blinded, Randomized, Controlled Trial. *Ann Rheum Dis.* 2011, July; 70(7):1191-1196.

DISEASE MODIFYING ANTIRHEUMATIC DRUGS AND DIABETES

Systemic inflammatory conditions such as rheumatoid arthritis (RA) and psoriasis have been associated with the development of cardiovascular risk factors such as diabetes mellitus (DM). Inflammation may cause insulin resistance and DM through several mechanisms. As tumor necrosis factor alpha (TNF- α) can block insulin receptors and decrease insulin sensitivity, this study was designed to examine the relationship between the use of this and other disease modifying antirheumatic drugs (DMARDs) and the risk of developing DM.

This retrospective cohort study included 121,280 participants diagnosed with RA or psoriasis from two large health insurance programs. This study began with the first prescription for DMARD identified between 1996 and 2008, with a mean follow-up period of 5.8 months. The relative risk of DM was estimated for those who were prescribed TNF inhibitors, methotrexate and hydroxychloroquine, compared with other DMARDs.

Subjects were 13,905 participants with 22,493 new treatment episodes. Among these were diagnosed 267 new cases of DM over a mean follow-up period of 5.8 months. These included 55 nonbiologic DMARD

users, 80 TNF inhibitor users, 82 methotrexate users, and 50 hydroxychloroquine users. Fully adjusted models revealed a greater reduction in the relative risk of DM among users of TNF inhibitors and hydroxychloroquine than among users of other nonbiologic DMARDs. The rates of DM were highest among individuals who switched to other nonbiologic DMARDs and lowest among TNF inhibitor users.

Conclusion: This study of patients with rheumatoid arthritis or psoriasis found that use of a tumor necrosis factor inhibitor or hydroxychloroquine was associated with a reduced risk of the development of diabetes mellitus.

Solomon, D., et al. Association between Disease-Modifying Anti-Rheumatic Drugs and Diabetes Risk in Patients with Rheumatoid Arthritis and Psoriasis. *J Am Med Assoc.* 2011, June 22/29; 305(24): 2525-2531.

ANOMIA TRAINING AND ELECTRICAL BRAIN STIMULATION

The most frequent symptom of post-stroke aphasia is impaired word retrieval (anomia). Chronic anomia is relatively resistant to intervention. As excitatory (anodal) transcranial direct current stimulation has been found to facilitate language learning in healthy and aphasic patients, this study explored whether anodal transcranial current stimulation enhances the outcome of short-term anomia training.

This randomized, double-blind, controlled, crossover trial included 12 patients with chronic anomia due to a left hemisphere ischemic stroke. All subjects completed a baseline neurologic examination and standardized language testing. In anomia training, 45 pictures depicting common objects were individually selected. These objects had been named incorrectly three times during three baseline runs. The 45 objects were divided into three sets of 15 objects matched for several linguistic variables.

Patients took part in three, consecutive training phases, each with a different stimulation condition. These conditions included anodal transcranial direct current stimulation, inhibitory (cathodal) transcranial

direct current stimulation, both applied over right temporo-parietal cortex, and placebo. The primary outcome measure was the ability to name objects immediately after training and two weeks after training completion.

All training conditions resulted in a significant increase in naming ability. The greatest improvement was seen with anodal transcranial direct current stimulation ($p=0.01$). *Post hoc* tests revealed better, overall improvement in the anodal condition than in the sham stimulation ($p=0.03$). No significant difference was seen between cathodal stimulation and sham ($p=0.28$). Poorer naming performance before treatment was associated with more pronounced improvement during anodal stimulation ($p=0.0067$).

Conclusion: This study of patients with chronic anomia due to stroke found that excitatory transcranial direct current stimulation, applied to the non-language dominant hemisphere, can enhance recovery of anomia.

Floel, A., et al. Short-Term Anomia Training and Electrical Brain Stimulation. *Stroke.* 2011, July; 42 (7): 2065-2067.

ANTI-THROMBIN III AND FIBRINOGEN AS PREDICTORS OF CEREBRAL ISCHEMIC STROKE

Acute cerebral ischemic stroke is the leading cause of disability and mortality in the United States. Due to the narrow time window for thrombolytic therapy, identifying diagnostic markers of ischemic stroke in the super acute stage may be of value. This study evaluated the effectiveness of several plasma biomarkers in identifying ischemic stroke prior to obtaining diagnostic imaging.

This study included 198 patients, 40 to 70 years of age, who presented to the emergency department within 4.5 hours of stroke symptoms. All subjects had NIHSS scores of seven to 22. Cerebral hemorrhage was excluded by emergency brain CT scan. Blood samples were collected before brain imaging and treatment initiation. Measures included plasma anti-thrombin III (AT III), thrombin - anti-thrombin III (TAT), fibrinogen, D-dimer and high-sensitivity C-reactive protein (hsCRP) levels. After the final

diagnosis was determined, cases were divided into stroke and non-stroke groups for comparison with lab values.

The level of AT III in the stroke group was significantly lower than that of the non-stroke group ($p < 0.001$), while levels of TAT, fibrinogen and hsCRP were higher in the stroke group than in the non-stroke group ($p = 0.000 - p = 0.001$). Although higher in the stroke group, D-dimer levels did not reach statistical significance. While plasma AT III and fibrinogen were highly sensitive and specific markers, elevated D-dimer and hsCRP were specific, but not sensitive, in predicting acute ischemic stroke.

Conclusion: This study suggests that, prior to imaging, plasma levels of AT-III and fibrinogen may be helpful in identifying patients with cerebral ischemic stroke.

Meng, R., et al. Antithrombin III Associated with Fibrinogen Predicts the Risk of Cerebral Ischemic Stroke. *Clin Neurol Neurosurg.* 2011, June; 113(5): 380-386.

RISK OF STROKE AFTER HOSPITALIZATION FOR INFECTION

While atherosclerotic disease, smoking and diabetes are well known contributors to the risk of ischemic stroke, little is known concerning potential precipitating events that may serve to trigger a stroke at a particular point in time. Previous studies have shown that biological changes associated with infection, including platelet activation and endothelial dysfunction, may serve as such a trigger. This study sought to determine the risk of ischemic stroke within 90 days of hospitalization for an infection.

This case crossover design included participants from the Cardiovascular Health Study (CHS), serving as their own controls. Exposure was defined as hospitalization for infection within 90, 30 or 14 days before stroke (defined as the case period) or equivalent time periods one or two years before the stroke (control periods). The prevalence of exposure during these time intervals was compared. Those with primary central nervous system infections and endocarditis were excluded. The analysis was adjusted

for age, gender, race, diabetes mellitus and current smoking.

During a median follow-up time of 12.2 years, 5,639 participants experienced 669 ischemic strokes. Of these, 29 had undergone a least one hospitalization for infection during the previous 90 days. Hospitalization for infection within 14 days was associated with an increased risk of stroke ($p = 0.007$). The elevated risk persisted for each predefined time window, with a decreasing point estimate for magnitude of risk as the time interval lengthened. The odds ratios for 14, 30 and 90 day intervals since hospitalization were 8.0, 7.3 and 3.4, respectively.

Conclusion: This study found that hospitalization for infectious disease increases the risk of acute ischemic stroke, with the highest incidence within 14 days of hospitalization, and with the risk remaining elevated through 90 days after discharge.

Elkind, M., et al. Hospitalization for Infection and Risk of Acute Ischemic Stroke: The Cardiovascular Health Study. *Stroke.* 2011, July; 42: 1851-1856.

BOTULINUM TOXIN FOR COMPLEX REGIONAL PAIN SYNDROME

Complex regional pain syndrome (CRPS) is a poorly understood condition causing severe neuropathic pain. Recent studies have suggested that botulinum toxin may have an anti-nociceptive action that is independent of the action on muscles, resulting from an inhibition of central and peripheral sensitization. This study explored the efficacy of botulinum toxin for the treatment of CRPS.

This retrospective chart review included data from patients with a diagnosis of CRPS who were treated for pain and dystonia of the neck with botulinum toxin A. Thirty-seven patients were included in the study, including 26 with CRPS type I and 11 with CRPS type II. Ten had localized CRPS predominantly involving one or both upper limbs. All patients were treated with intramuscular botulinum toxin A, delivered to specific upper limb girdle and neck muscles using EMG guidance. The total amount of botulinum toxin used per patient was 100 units. Pain scores were recorded

on an 11-point Likert scale at baseline and at four weeks' follow-up.

All patients had severe pain at baseline, ranging from seven to 10 on the Likert scale. The average pain score at baseline was 8.2, falling to 4.5 after treatment. The pain scores were reduced by 11 to 78% ($p < 0.001$). One patient developed a transient neck drop that resolved within two weeks.

Conclusion: This retrospective study of patients with CRPS who underwent botulinum toxin injections found a significant reduction in pain scores as measured four weeks after the injections.

Kharker, S., et al. Intramuscular Botulinum Toxin A (BtxA) in Complex Regional Pain Syndrome. *Pain Physician.* 2011, May/June; 14(3): 311-316.

SHOCKWAVE THERAPY FOR PATELLA TENDINOPATHY

Patellar tendinopathy is a common injury among jumping athletes, with little consensus concerning the most appropriate treatment for this condition. As studies have demonstrated that the underlying pathology of chronic tendinopathy is degenerative tendinosis, treatments which enhance regeneration have been explored. This study investigated the effects of extracorporeal shockwave therapy for symptom and functional improvement among jumping athletes.

This randomized, controlled trial included Dutch volleyball, basketball or handball athletes with a diagnosis of patellar tendinopathy of three to 12 months' duration. Those patients were randomized to either a placebo or a shockwave therapy group. Those in the shockwave group received three treatments, with the placebo group receiving three sham treatments. All participants completed a baseline questionnaire concerning demographic variables and sports participation. The primary outcome measure was the severity of patella tendinopathy, determined with the Victorian Institute of Sport Assessment - Patella (VISA-P) questionnaire. Secondary outcome measures included pain during activities of daily living, pain with sports participation and subjective improvement.

Among the 62 athletes recruited, no significant difference was found between the groups on the primary outcome measure ($p=0.82$). Scores on a visual analog scale for pain during various activities did not differ significantly between the groups. However, one week after final treatment, significantly more athletes in the treatment group reported that their symptoms had improved and rated the treatment as beneficial ($p=0.01$).

Conclusion: This study of competitive jumping athletes with patella tendinopathy did not find extracorporeal shockwave therapy more effective than placebo for improving pain and function. Despite this result, twice as many athletes reported subjective improvement with shockwave therapy than did the placebo group.

Zwerver, J., et al. No Effect of Extracorporeal Shockwave Therapy on Patella Tendinopathy in Jumping Athletes during the Competitive Season: A Randomized Clinical Trial. **Am J Sports Med.** 2011, June; 39: 1191-1199.

CRYOTHERAPY AND ANKLE JOINT POSITION SENSE

Cryotherapy, or icing, is a very popular treatment method for both acute and chronic athletic injuries. This therapy has been found to reduce pain, inflammation and muscle spasms. In addition, cryotherapy influences neuromuscular properties of the muscle, including nerve conduction velocity and muscle contraction. In fact, results from previous research suggest a linear relationship between the rate of muscle spindle discharge and muscle temperature. That finding is important because any change in the afferent signal can in turn lead to motor response modification. If neuromuscular function is compromised by treatment, ankle injury may occur when exercise is resumed. This study assessed whether cryotherapy affects the ability to detect joint position in a healthy athlete.

Thirty healthy female volunteers were recruited for participation. At baseline, the subjects were

blindfolded and the ankle joint positioned to a target angle. The ankle was then moved, with the subjects asked to reproduce the target angle. This process was then completed after cryotherapy, administered by immersing the foot in cold water for 15 minutes. The errors found in reproducing the target angle were compared between the baseline and the cryotherapy conditions.

No significant difference was seen between the baseline and cryotherapy conditions for joint position errors at the middle range of active and plantar flexion, ($p=0.80$, and 0.14 , respectively). This finding also held true for active and passive dorsiflexion ($p=0.72$ and 0.35 , respectively.)

Conclusion: This study of healthy, female volunteers found that 15 minutes of water immersion at 6°C does not significantly alter the middle range of joint position sense at the ankle.

Khanmohammadi, R. et al. The Effect of Cryotherapy on the Normal Ankle Joint Position Sense. **Asian J Sports Med.** 2011, May/June; 2(2): 92-98.

DIFFUSION TENSOR IMAGING AND BLAST RELATED TRAUMATIC BRAIN INJURY

Over 300,000 blast-related brain injuries have been recorded due to the wars in Iraq and Afghanistan. In most cases, these injuries have been categorized as mild traumatic brain injuries (TBIs), with no intracranial abnormalities seen on CT or conventional MRI. As simulation and animal models have suggested that traumatic axonal injury is the primary feature of human blast related TBI, this study used diffusion tensor imaging (DTI) to screen for axonal injury in patients with such injuries.

Subjects were 63 United States military personnel clinically diagnosed with TBI, with no imaging abnormalities seen on conventional evaluation. All reported blast exposure, as well as a blast related mechanical injury, and were seen at a median of 14 days since injury. Twenty-one military personnel who had experienced blast exposure, but had no clinical diagnosis of TBI,

served as a control group. All subjects underwent evaluation by DTI, with scans evaluated by radiologists, held blind to group placement, who reviewed 17 regions of interest on each scan.

All subjects were confirmed to have normal, non-contrast head CT results. Significantly greater reductions in relative anisotropy were noted in the group of subjects with TBI than in the control group ($p<0.02$). Eighteen of the 63 subjects with TBI had abnormalities on DTI that were consistent with multifocal traumatic axonal injury. Specifically, relative anisotropy was reduced in two or more brain regions in each of the 18 subjects. An additional 20 subjects with TBI had one abnormality detected on DTI, while no abnormalities were detected in 25 subjects. DTI revealed abnormalities in the middle cerebral peduncles, cingulum bundles and right orbitofrontal white matter. At 6-12 months after enrollment, persistent abnormalities were found, consistent with evolving injuries.

Conclusion: This study of military personnel diagnosed with blast related traumatic brain injury found that diffusion tensor imaging can help clarify the presence and location of axonal injuries in these individuals.

MacDonald, N., et al. Detection of Blast Related Traumatic Brain Injury in U.S. Military Personnel. **New Engl J Med.** 2011, June 2; 364(22): 2091-2100.

HEMORRHAGIC COMPLICATIONS OF VENTRICULOSTOMY

Ventriculostomy is a routine practice for neurosurgeons for the evaluation and/or treatment of patients with hydrocephalus or traumatic brain injury with a poor neurological examination. Hemorrhage is a known complication of this procedure. This meta-analysis evaluated the risk of hemorrhagic complications after ventriculostomy.

This meta-analysis was completed using a search of MEDLINE and Pub Med, looking at all studies of 25 or more patients conducted since 1970. The Web of Science was used to determine the

number of times each article had been cited in the published literature.

Sixteen studies were identified, including data from 2,428 procedures. The cumulative rates of hemorrhage and significant hemorrhage from all 16 studies were 7.0% ($p < 0.05$) and 0.8% ($p < 0.05$), respectively. Among the studies in which patients underwent routine postoperative scanning, the cumulative rate of hemorrhage was 12.1% ($p < 0.05$), and that of significant hemorrhage 1.4% ($p < 0.05$).

Conclusion: This meta-analysis of patients undergoing ventriculostomy by neurosurgeons found that the overall hemorrhagic complication rate is approximately seven to twelve percent, and the rate of significant hemorrhage approximately 1.4%.

Bauer, D., et al. Meta-Analysis of Hemorrhagic Complications from Ventriculostomy Placement by Neurosurgeons. *Neurosurg*. 2011, August; 69: 255-260.

OBESITY, RACE AND RISK OF DEATH AND FUNCTIONAL DECLINE

With the growing epidemic of obesity, many studies have focused on the effect of obesity on mortality in the elderly population. As many of these data are derived from largely white populations, this study explored the effect of obesity in a broad population of elderly individuals.

This study used data from the Medicare Current Beneficiary Survey, including community dwelling Medicare beneficiaries, with the data collected between 1994 and 2000. At baseline, and annually for two years, participants were questioned regarding self-reported body mass index, demographic information and functional capacity as measured by activities of daily living (ADL) or instrumental activities of daily living (IADL). Mortality was tracked, with up to 14 years of follow-up data available.

A total of 20,975 individuals were included in the analysis. Of these, 37% were overweight and 18% obese. During the 14 year follow-up, 48% died. Adults with a body mass index of greater than 35 kg/m² had

significantly higher mortality, with risk hazard ratios of 1.49 in men and 1.21 in women, as compared with the reference group. Both overweight and obesity were associated with new or progressive ADL or IADL disability in a dose dependent manner. Significant interactions were detected between BMI and gender, but not BMI and race, for any outcome.

Conclusion: This study of Medicare recipients found that elevated body mass index was associated with all cause mortality only among those with a body mass index of 35 kg/m² or more. Elevated body mass index was associated with new or worsening disability within two years.

Wee, C., et al. Obesity, Race and Risk of Death or Functional Decline among Medicare Beneficiaries. *Ann Intern Med*. 2011, May 17; 154(10): 645-655.

PHYSICAL ACTIVITY AND MENTAL HEALTH

"Health related quality of life" is a term for used multiple outcomes related to self-reported physical, emotional and social functioning. This study investigated the association between health related quality of life and self-reported exercise in the adult population.

This Norwegian population-based study included a random sampling of 6,419 participants in the Nord-Trondelag Health Study. For all subjects, health-related quality of life was measured with the SF-8 Health Survey, and a short version of the SF-36, Physical and Mental summary scales. The frequency of physical activity was defined as the number of times a person had exercised in the previous week, classified as never, one to three times, four to six times, or daily. Duration was described as the average number of minutes per session, with intensity and assessed by the Borg rating scales of perceived exertion scale. Information concerning diseases was obtained by self-report.

A total of 4,500 participants were included in the final analysis. Of these, 40% of the group was less physically active than the recommended 150 minutes per week

of moderate intensity exercise. Physical activity was consistently associated with better physical and mental health in both males and females, as well as in both young and old adults. Interactions were noted between frequency, duration and intensity of activity and age group for both males and females. The association between level of exercise and physical health was stronger among those over the age of 65, although no such differences were found in mental health.

Conclusion: This Norwegian study found that physical activity is associated with better physical and mental health in a curvilinear manner, with the largest adjusted differences found between those reporting no exercise and those reporting any degree of exercise.

Bertheussen, G., et al. Associations between Physical Activity and Physical and Mental Health: A HUNT III Study. *Med Sci Sport Exer*. 2011, July; 43(7):1220-1228.

TELEVISION WATCHING AND THE RISK OF TYPE II DIABETES, CARDIOVASCULAR DISEASE AND ALL CAUSE MORTALITY

Previous research suggests that television watching is associated with decreased rates of physical activity and increased consumption of unhealthy food. This study summarized all published, prospective cohort studies quantifying the dose response relationship of television viewing and the risk of poor health outcomes.

This meta-analysis was conducted using a systematic search of published studies in MEDLINE and EMBASE. Included studies had a prospective design, a sample that was healthy at baseline and estimates of relative risk (RR) or an odds ratio with 95% confidence intervals (CIs) or reported data to calculate these figures. These data were used to perform a dose response meta-analysis.

Of the 1,655 articles identified by the initial search, 10 were used for full review, with four reporting on the results of type II diabetes, six on fatal or nonfatal cardiovascular disease and four on all cause mortality. The

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relative risk of disease development was significantly increased for two hours of television viewing per day for all outcomes analyzed. The relative risk of diabetes mellitus per two hours of television viewing per day was 1.2, while that for cardiovascular disease was 1.15 and that for all cause mortality was 1.13 ($p < 0.001$). The dose response curves were linear for diabetes mellitus and cardiovascular disease with at least two hours of viewing, and linear for mortality after three hours of television viewing.

Conclusion: This meta-analysis found that television viewing for more than two hours per day is associated with an increased risk of diabetes mellitus, cardiovascular disease and all cause mortality.

Anders, G., et al. Television Viewing and Risk of Type II Diabetes, Cardiovascular Disease and All Cause Mortality: A Meta-Analysis. **JAMA**. 2011, June 15; 305(23): 2448-2455.

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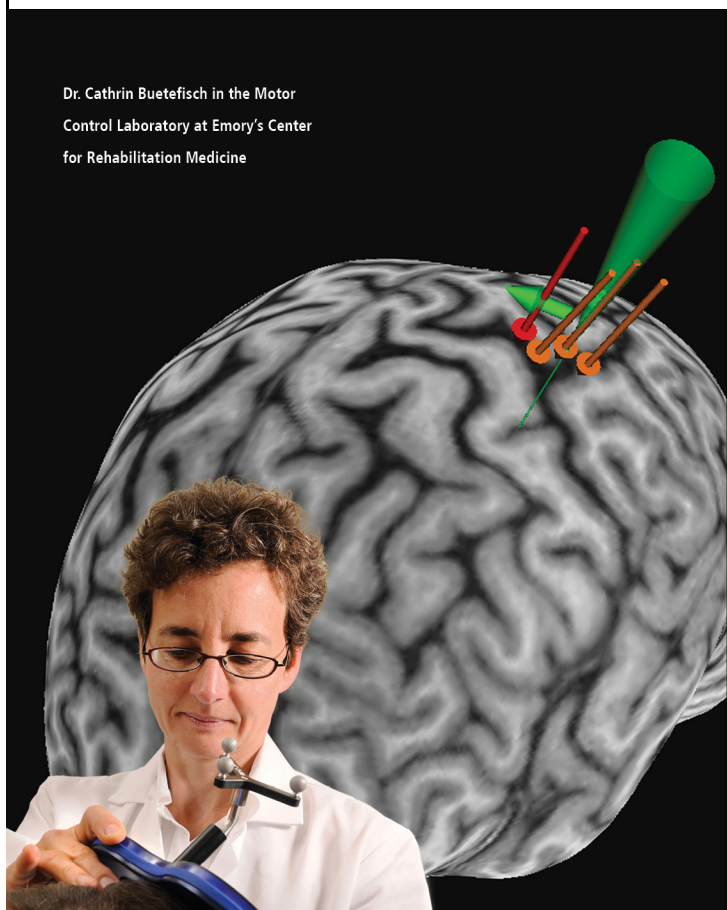
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