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NEUROPROTECTIVE EFFECT OF HIGH-DOSE VITAMIN D IN ISCHEMIC STROKE

Previous studies have shown an association between the severity of vitamin D deficiency and volumes of ischemic stroke, functional outcomes, and stroke recurrence. This study evaluated the effect of a high dose of vitamin D_3 on the outcomes of patients with acute ischemic stroke.

This prospective, double-blind, randomized trial included adult patients admitted with a moderate ischemic stroke, an NIHSS score of 5 -15, and a vitamin D deficiency (Serum 25-OH vitamin D <30mL/ min/1.73m^2). Those randomized to a treatment group received a single-dose intramuscular injection of 600,000 IUs of vitamin D_3.

Data collected included age, gender, serum vitamin D levels, and hospital length of stay. Neuron damage was measured by Neuron-Specific Enolase (NSE), a marker that correlates with clinical deficits and infarction volume. The primary outcome variables were the effect of vitamin D_3 supplementation on the NSE level and functional outcomes.

Forty-five patients were randomized, including 20 in the intervention group. At 48 hours post-intervention, the average NIHSS score was significantly lower in the intervention arm than in the control arm (p=0.008). At three months, the treatment group demonstrated better modified Rankin Scale (mRS) scores of function than did the control group (p=0.03). At 48 hours, the NSE levels were 6.74 in the control group and 6.11 in the treatment group (p=0.80).

Conclusion: This study of patients with acute ischemic stroke, who were admitted with a vitamin D deficiency, found that a single dose of 600,000 IU of vitamin D_3 could significantly improve neurologic functional recovery.

Hesami, O., et al. The Evaluation of the Neuroprotective Effect of a Single, High-Dose Vitamin D_3 In Patients with Moderate Ischemic Stroke. **Stroke Res Treatment.** 2022. doi.org/10.1155/2022/8955660.

SENSE OF SMELL IN CONCUSSION

In cases of moderate or severe traumatic brain injury (TBI), research has demonstrated an association between the severity of the injury and the degree of olfactory dysfunction. Little is known however about the acute effects of concussion on the sense of smell. This study examined the association between an impaired sense of smell post-concussion and the duration of recovery.

Subjects were patients diagnosed with a concussion in an emergency department and assessed by the study group within seven days of their injury. The subjects were reassessed one week later and every two weeks until week eight. The sense of smell was assessed using the University of Pennsylvania Smell Identification Test (UPSIT). Concussion symptoms and symptom severity were assessed with the Sport Concussion Assessment Tool 3 (SCAT3). Recovery from the concussion was defined as the person having returned to pre- concussion 'normal' cognitive (i.e., work or school activities), physical, and sensory activities.

The average score on the week one administration of the UPSIT was 34.7/40 with 62% classified as normosmic at week one. Severe, moderate, and mild hyposmia in the first week was measured in 5 (3%), 10 (6%), and 48 (29%) individuals, respectively. There was no statistically significant relationship between week one UPSIT scores and SCAT3 total symptom scores. The UPSIT scores were not associated with time to recovery (p > .05). The odds ratio between week one UPSIT scores and concussion recovery at week eight was 1.05. When smokers were eliminated the odds ratio drops to 1.00.

Conclusion: This study found that an acute impairment of the sense of smell following concussion was not associated with symptom severity on the Sport Concussion Assessment Tool 3 or time to recovery.

Foster, E., et al. The Toronto Concussion Study: Sense of Smell is not Associated with Concussion Severity or Recovery. **Brain Injury.** doi.org/10.1080/02699052.2022.2037713.

BLOOD PRESSURE AND COGNITIVE IMPAIRMENT IN OLDER WOMEN

Studies have shown that hypertension is one of the most important risk factors for cerebrovascular disorders and dementia. Several studies have found no association between midlife hypertension and the risk of mild cognitive impairment. This study investigated the association of blood pressure and hypertensive treatment with mild cognitive impairment and dementia in older women.

Data were obtained from the prospective Women's Health Initiative Memory Study (WHIMS) which included 7,207 females, 65-79 years of age recruited between May 28, 1996, and December 13, 1999. The original study was designed to assess the effect of supplemental progesterone. The WHIMS subjects underwent annual cognitive screening with follow-up in clinics for neuropsychological testing. Hypertension was defined using the American Heart Association 2017 guidelines for High BP in adults (>130/80 mm Hg).

Of the 7,207 participants with a mean of 11 years follow-up, 1,132 developed mild cognitive impairment (15.7%) 739 developed probable dementia (10.3%), and 1,533 (21.3%) were classified as having cognitive loss (21.3%). Compared to those with a systolic blood pressure/ diastolic blood pressure of less than 120/80 mm Hg, those with a blood pressure of 140/90 or greater had a significant, increased risk of mild

cognitive impairment (p=0.042). Those with hypertension, but with controlled SBP of less than 120 mm Hg did not have this significant risk. In addition, increased pulse pressure was associated with an increasing risk of cognitive loss (p=0.0002) and mild cognitive impairment (p=0.0005)

Conclusion: This prospective study of older women with hypertension found that those with elevated systolic blood pressure or pulse pressure are at higher risk of cognitive loss and mild cognitive impairment than are with normotension.

Liu, L., et al. Association between Blood Pressure Levels and Cognitive Impairment in Older Women: A Prospective Analysis of The Women's Health Initiative Memory Study. **Lancet Healthy Longev**. 2022; 3: e42–53.

PERIPHERAL NERVE BLOCKS FOR HEADACHE PAIN

Headache disorders are a common condition affecting the majority of the population at some point in life. Current treatment options may be effective but often have a relatively slow onset of relief. This literature review evaluated the efficacy of peripheral nerve blocks for the treatment of acute headache pain.

A literature search was conducted for randomized, placebo-controlled studies of patients with acute headaches, treated with nerve blocks of the greater occipital nerve, sphenopalatine ganglion blocks, or trigger point injections. The primary outcome was pain relief within 120 minutes of treatment. From the review, 11 studies were chosen, with a total sample size of 860 patients. For the peripheral nerve block group, seven trials studied the sphenopalatine ganglion block, and four trials studied the greater occipital nerve block. Five studies used lidocaine (10 to 80 mg) and six studies used bupivacaine (3 to 80 mg) as the choice of anesthetic for the blocks.

The meta-analysis found that, compared to placebo, pain scores were significantly reduced in the treatment group at 15 minutes (p=0.005), and thirty minutes (p=0.004). Of the adverse events reported, all were minor, with no serious adverse events attributed to the treatment.

Conclusion: This meta-analysis of studies of patients presenting to the emergency department with a chief complaint of headache, found that peripheral nerve blocks are an effective and rapid treatment option.

Patel, D., et al. Effectiveness of Peripheral Nerve Blocks for the Treatment of Primary Headache Disorders: A Systematic Review and Meta-Analysis. **Ann Emerg Med.** 2022, March; 79(3): 251-261.

AMANTADINE TO IMPROVE CONSCIOUSNESS IN NON-TRAUMATIC BRAIN INJURY

Amantadine, an N-methyl-D-aspartate receptor antagonist and indirect dopamine agonist, has been used to enhance elements of cognitive performance. However, the effect of this medication in the acute care setting is not clear, as studies of its effect have been limited in size or lacking a control group. This study pooled data to better understand the efficacy of this medication.

Data were pooled from five observational studies conducted at a tertiary care center in Germany. These studies initially focused on patients with primary, spontaneous intracerebral hemorrhage, ischemic stroke, subarachnoid hemorrhage, community-acquired bacterial meningitis, or status epilepticus. The amantadine group received at least one dose of amantadine, 100 mg or more, with the intention to improve consciousness. The primary outcome measure was improvement of consciousness at day five, characterized as an increase in GCS score of at least three points within five days after initiation (treatment group) or a control group.

The final study sample consisted of 184 patients admitted to the neurological intensive care unit (ICU) and ventilated ≥7 days. Compared to controls, amantadine was associated with a GSC score improvement of three or more at day five (p<0.001) and day 10 (p=0.001). The rate of all-cause mortality at 90 days was not significantly different between the control and amantadine groups (p=0.758). A non-significant difference was seen in the rate of epileptic seizures after initiation of amantadine (p=0.079).

Conclusion: This study of patients with non-traumatic brain injury with prolonged disorders of consciousness found that amantadine was associated with improved consciousness, with a slightly increased risk of seizure activity.

Rühl, L., et al. Amantadine Treatment is Associated with Improved Consciousness in Patients with Non-Traumatic Brain Injury. **J Neurol Neurosurg Psychiatry**. 2022; 0: 1-6. doi:10.1136/jnnp-2021-327408.

KETAMINE FOR REFRACTORY PAIN

Ketamine is an anesthetic agent with powerful analgesia and amnesia. The efficacy of this medication used at subanesthetic doses remains unclear. This study assessed the effect of ketamine on pain among patients with refractory chronic pain over one year.

Subjects were adults with chronic pain for more than six months, treated at one of 30 pain clinics. The patients received ketamine, given at the individual clinic protocol, ranging from 0.2 mg/kg over 40 minutes to 0.1 mg/kg per day, once a week for eight weeks. All subjects were followed for one year to determine pain intensity, medications, nonmedication treatments, and adverse events. For this study, data were analyzed only for those who received at least one infusion of ketamine.

Data from 256 patients were used in the long-term analysis. For this group, the average Numerical Pain Rating Scale score decreased from 6.8/10 at baseline to 5.7/10 at one week and 5.7/10 at 12 months ($p<0.001$). A statistical difference was found in 30% (R30%) and 50% (R50%) pain intensity reduction, from baseline to one week, between patients with "mild pain" and patients with "severe pain" (R30%, 44.7% vs 15.1%, $p<0.05$: R50%, and 31.6% vs 6.7%, $p<0.05$, respectively).

Conclusion: This study of patients with refractory chronic pain found that ketamine could reduce pain, with the reduction maintained over one year, and with the likelihood of significant pain reduction found to be highest among those with mild pain.

Alexandrine, C., et al. Ketamine for Refractory Chronic Pain: A One-Year Follow-Up Study. **Pain.** 2022, April; 163 (4): 690-701.

CANNABIS USE BY OLDER ADULTS

The National Survey on Drug Use and Health (NSDUH) reported a 71% increase in cannabis use between 2007 and 2013, among adults 50 years and older. This study assessed the prevalence of cannabis use in older adults (≥50 years old) seen in the primary care setting.

Data were obtained from primary care clinics within a healthcare system with over 1,500 providers and an estimated 250,000 patients annually. Eligible patients were 50-101 years of age, seen by their primary care physicians between July 2019 and May 2020. At each exam, the participants were asked about their substance use, including tobacco, alcohol, and other substances, from a list of over 30 drugs, including cannabis, methamphetamine, and opioids. The health record was used to abstract information concerning medical intervention, including prescriptions.

Data were obtained for 42,455 patients with a median age of 63 years. Of these, 7.6% reported current cannabis use, with four percent reporting tobacco use. Cannabis use varied by age group, with only two percent of those 85 years of age or older reporting current use. Compared to this age group, the adjusted odds ratio for cannabis use was 4.1 for those 50-64 years of age, 4.2 for those 65 to 71 years of age, and 1.9 for those 75 to 84 years of age.

Conclusion: This California study of patients 50 years of age and older found that 7.6% reported current cannabis use, with this percentage decreasing with age and increasing with medical comorbidity.

Javanbakht M., et al. Cannabis Use, Comorbidities, and Prescription Medication use Among Older Adults in a Large Healthcare System in Los Angeles, CA, 2019-2020. **J Am Geriatr Soc**. 2022, Mar:70(3) 1-12.

IPSILATERAL HAND IMPAIRMENT AND LONG-TERM OUTCOME AFTER STROKE

Deficits of the ipsilateral hand (ILH) are frequently reported after a stroke, although little is known about the frequency and the impact of this finding on the long-term outcome. This study of patients with a subacute stroke assessed the factors associated with ILH.

Subjects were consecutive patients admitted to a hospital stroke unit between 2003 and May of 2021. Subjects were adults with a first-ever unilateral ischemic or hemorrhagic stroke between eight and 183 days of onset. The ILH was evaluated using the Purdue Pegboard Test (PPT) to assess dexterity and a hand dynamometer to measure grip strength. A second evaluation was conducted between seven and 12 months after stroke onset, to assess neurological deficits with the National Institutes of Health Stroke Scale (NIHSS). Function was measured with the modified Rankin Score (mRS) and categorized into good ($mRS \leq 1$) and poor outcome ($mRS \geq 2$).

Data were collected for 209 patients. Rates of ILH impairment of PPT and/or grip scores were 28.6% for moderate impairment and 56.0% for mild impairment. The nine-month mRS function score was significantly related to ILH-PPT ($p<0.001$) and ILH grip ($p<0.001$). Of those with a PPT or grip z-score of less than one, 76% had a poor functional outcome ($p<0.001$).

Conclusion: This study of patients hospitalized for an acute stroke found that ipsilateral hand impairment was an independent predictor of functional outcome at nine months.

Razak, R., et al. Ipsilateral Hand Impairment Predicts Long-Term Outcome in Patients with Subacute Stroke. **Euro J Neurol.** 2022 Mar 11. DOI: 10.1111/ene.15323.

DETECTION OF EPILEPTIC SEIZURES

An epileptic seizure is a transient occurrence of abnormal, excessive, or synchronous neuronal activity in the brain. The verification of an episode of seizure activity is often a challenge. Neurogranin (NRGN) is a small neuronal protein responsible for post-synaptic signal transmission. This biomarker is evident in early brain damage and impaired signal transmission. This study assessed the utility of this biomarker for diagnosing an acute epileptic event.

This prospective study included patients who had experienced an epileptic seizure, presenting to the emergency department. Patients with brain diseases of structural or infectious causes were excluded. A blood sample was taken from the symptomatic patients and a healthy control group for measurement of the serum NRGN.

The median NRGN levels were 184.16 in the seizure group and 97.9 in the control group ($p<0.005$). No statistically significant relationship was determined between NRGN and CK and lactate levels ($p>0.05$).

Conclusion: This study of patients with witnessed epileptic seizures found that levels of neurogranin were significantly higher than those of a control group, helping to confirm the diagnosis of seizure activity.

Kalkan, A., et al. A New Biomarker in the Differential Diagnosis of Epileptic Seizure: Neurogranin. **Am J Emerg Med**. 2022, April; 54: 147-150.

REMOTE SENSING FOR DETECTING PULMONARY EDEMA

Patients who present to the emergency department (ED) with dyspnea are evaluated with a combination of physical exams, radiographs, and biomarkers. These measures can be expensive and time -consuming. This study assessed the ability of a wearable remote sensing device, the Remote Dielectric Sensing (ReDS) to assist with the diagnosis of pulmonary edema. This wearable radar system transmits low-power electromagnetic signals through the thorax and reports total lung fluid via a bedside console.

This study used a postoperative convenience sample in a U.S. intercity academic ED. Eligible patients were adults with a chief complaint of shortness of breath. The subjects were fitted with the ReDS, with a readout obtained within 90 seconds. The results of this output were compared with the ultimate diagnosis obtained after routine work-up.

Data were analyzed for 123 patients. Dyspnea, secondary to pulmonary edema, was diagnosed in 30.9% of the patients. Using the recommended cutoff for the detection of pulmonary edema, the ReDS detected pulmonary edema in 30 of 38 patients. A ReDS reading of 37% was found to be optimal for detecting pathologic lung fluid. A cutoff of 41% provided an accuracy of 84.5% for pulmonary edema, with a sensitivity of 71.7% a specificity of 90.5%, a positive predictive value of 77.8%, and a negative predictive value of 87.4%.

Conclusion: This prospective study of undifferentiated dyspneic patients presenting to the emergency room found that a remote dielectric sensing device can provide rapid and moderately sensitive and specific data to help diagnose pulmonary edema.

Rafique, Z., et al. Remote Dielectric Sensing for Detecting Pulmonary Edema in the Emergency Department. **Am J Emerg Med.** 2022, Feb 24; 55: 11-15.

NEUROLOGIC SEQUELAE ONE YEAR AFTER COVID

A number of studies have described neurologic complications associated with COVID-19. This prospective study reviewed the natural history of neurologic signs and symptoms among patients treated for COVID-19.

Subjects were adults, diagnosed with COVID-19, who had symptoms persisting for at least six weeks after the initial diagnosis. All underwent a neurologic examination, including a cardiopulmonary evaluation at three months, with tests of cognition, depression, anxiety, laboratory tests, and a computed tomography test of the chest.

Of those enrolled in the study, 76 of the 135 who presented at the three -month follow-up completed the one-year follow-up. Fifty-nine percent reported at least one neurologic symptom persisting one year after diagnosis. The most common of these were fatigue (38%), concentration difficulties (25%), forgetfulness (25%), and sleep disturbance (22%). Objective neurologic abnormalities were found in 64%, including hyposmia (51%), abnormal reflexes (20%), and positive frontal release signs. Cognitive deficits were evident in 18% after one year, as compared to 23% at the three-months follow-up. Signs of anxiety or depression were evident in 29% at three months and six percent at 12 months.

Conclusion: This prospective, longitudinal, observational study of patients diagnosed with COVID-19 found that one year after diagnosis, new neurologic disorders remained apparent in 12%.

Rass, V., et al. Neurological Outcomes One Year after Covid–19 Diagnoses: A Prospective, Longitudinal, Cohort Study. **Euro J Neurol.** 2022, March 3; 29: 1218-1221.

VITAMIN D DEFICIENCY IN HEALTHCARE WORKERS DURING COVID

To date, only a few reports have focused on the nutritional status of healthcare workers (HCWs) during the COVID-19 pandemic. As Vitamin D [25(OH)D] deficiency has been reported to be an independent risk factor for COVID-19 seroconversion, this study assessed the vitamin D levels of healthcare workers and compared these to levels of natural killer (NK) cell activity.

This prospective, observational study included 361 healthcare workers with an average age of 35 years. Blood samples were drawn between March 1, 2021, and March 5, 2021, to evaluate levels of vitamin D, zinc, total protein, albumin, iron, hemoglobin A1c, lipids, liver function, renal function, and NK cells.

The 25(OH)D levels were deficient (<20 ng/mL) in 89.7% (78/87) of the males and 92.7% of the females. Severe deficiency (<10ng/ml) of 25(OH)D was noted in 25.3% of the males and 48.2% of the females. In addition, the NK cell activity was below normal in 42.5% of the males and 58.4% of the females. However, no correlation was found between the NK cell activity and the 25(OH)D level (p=0.374).

Conclusion: This Japanese study of healthcare workers found that 90% had a vitamin D deficiency, thought to be in part due to the long-term indoor activity resulting from the COVID-19 activity restriction.

Funaki, T., et al. Serious Vitamin D Deficiency in Healthcare Workers during the COVID- 19 Pandemic. **BMJ Nutr Prev Health**. http://dx.doi.org/10.1136/bmjnph-2021-000364.

VITAMIN D SUPPLEMENTATION AND FRACTURES IN ADULTS

Research has shown that vitamin D plays a critical role in musculoskeletal health. However, conflicting evidence remains regarding the benefit of vitamin D supplementation in reducing the risk of fracture. This literature review evaluated the benefits of vitamin D supplementation in reducing fracture risk in older adults.

This umbrella review included systematic reviews (SRs) and meta-analyses (MAs) of randomized, clinical trials evaluating fracture risk in adults. Studies published between January 2010 and October 23, 2020, were eligible for consideration. From the review, 81 papers were chosen, of which 25 assessed fractures or fall-related fractures.

Of the 19 SRs/MAs that compared vitamin D alone with a placebo/ control, only three were of moderate quality, published by the Cochrane Group. Summarized, Vitamin D alone

was not found to protect against fractures when compared with a placebo. Most of the SRs/MAs showed a protective effect of calcium combined with vitamin D compared with placebo/control. One Cochrane study, judged as being of high quality, found a 16% relative risk reduction (RRR) in hip fracture, with Ca/D supplementation compared with placebo/control.

Conclusion: This large umbrella study of systematic reviews and meta -analyses found that calcium, combined with vitamin D may reduce the risk of fractures, with no such findings for Vitamin D alone.

Chakhtoura, M., et al. Vitamin D Supplementation and Fractures in Adults: A Systematic, Umbrella Review of Meta-Analyses of Controlled Trials. **J Clin Endocrinol Metab.** 2022, March; 107(3): 882-898.

CLINICAL EFFECTIVENESS OF MUSIC ON DEMENTIA AND DEPRESSION IN THE ELDERLY

From 2019 through 2020, more than half of older adults living in residential age care (RAC) in Australia were diagnosed with dementia. Depression was identified as the most common health condition affecting the care of these residents. This study evaluated the effect of music intervention on symptoms of depression in an elderly institutionalized setting.

The Music Interventions for Dementia and Depression in Elderly Care (MIDDEL) is a cluster-randomized, controlled trial involving residents of RACs. The subjects were 65 years of age or older, had a diagnosis of dementia, and experienced mild to severe depressive symptoms. The groups were randomized to receive 45-minute sessions of group music therapy (GMT), recreational choir singing (RCS), or both. The GMT involved groups of eight to ten participants engaged in the singing of familiar songs, music-stimulated reminiscence, improvising on percussion instruments, and spontaneous or directed movement to music. The RCS intervention employed larger groups (15 to 20 participants), with facilitated group singing, with lyrics displayed on a screen. Music sessions were 45 minutes per session, twice per week for three months and thereafter once per week for three months. The primary endpoint was depressive symptoms scores at six months, assessed using the Montgomery-Åsberg Depression Rating Scale (MADRS). Secondary outcome measures included neuropsychiatric symptoms and quality of life measures.

Data were collected for 318 residents over a mean of 22.2 GMT sessions and 20.0 RCS sessions. At all-time points compared to the control group, MADRS scores were better in the RCS group (p=0.02).

Conclusion: This study of patients with dementia and depression found that recreational choir singing could improve symptoms of depression.

Baker, F., et al. Clinical Effectiveness of Music Interventions for Dementia and Depression in Elderly Care (MIDDEL): Australian Cohort of an International, Pragmatic Cluster-Randomized, Controlled Trial. **Lancet Healthy Longev.** 2022, March; 3: E153-E165.

TREATMENT OF THIRD BRANCH TRIGEMINAL NEURALGIA

For patients with trigeminal neuralgia, percutaneous balloon compression (PBC) has been used as a treatment since 1983. For those with V3 involvement radiofrequency thermocoagulation (RFT) is often suggested. Noting a relatively poor efficacy of RFT the authors tested the effect of a modified percutaneous balloon compression (mPBC) for the treatment of V3-associated neuralgia.

The subjects were consecutive patients with third branch trigeminal neuralgia. Of these, 51 patients treated between 2015 and 2016 underwent a standardized PBC. After the introduction of the mPBS, 81 were treated with this technique from 2016 to 2019. Pain was assessed before and after surgery with the Barrow Neurological Institute Pain Intensity Scale. This five-point scale ranges from no pain to severe pain, no relief.

Complete postoperative pain relief was found in 95.1% of those in the mPBS group and 84.3% of those in the standard treatment group ($p<0.05$). Postoperative follow-up at a mean of 30.2 months revealed that 77.8% of the mPBS group and 54.9% of the PBS were pain-free.

Conclusion: This study of patients with trigeminal neuralgia involving the third branch found that a modified percutaneous balloon compression technique could provide complete pain relief in 95% of the patients, with 77.8% maintaining complete pain relief at 30.2 months

Lu, Z., et al. Treatment of Third Branch Trigeminal Neuralgia with a Balloon Inflated in the Foramen Ovale. **Front Neurol.** 2022, February 23: doi: 10.3389/fneur.2022.826653.

COGNITIVE PERFORMANCE AFTER TOTAL HIP ARTHROPLASTY

Osteoarthritis (OA) of the hip is one of the most prevalent joint conditions, characterized by chronic pain. Previous studies have documented a relationship between pain and cognitive decline, although the underlying reasons for this relationship are not fully understood. This study assessed the effect of hip pain reduction after a total hip arthroplasty (THA) and the concurrent changes in cognition.

This prospective cohort study included patients with end-stage OA, scheduled to undergo a unilateral THA. Cognition was assessed with standardized neuropsychological and patient-reported questionnaires preoperatively and at three and six months postoperatively. The primary outcome variable was the change in cognitive performance from baseline to six months post-surgery.

Subjects were 148 patients with a mean age of 67.4 years. At six months, those subjects reported a significant reduction in pain ($p=0.001$) and improved hip function as measured by Harris Hip Scale scores ($p<0.001$). Improvements were also noted in scores of visual construction and visual memory, as measured using the Rey-Osterrieth Complex Figure Test (ROCF) Memory Quotient ($p<0.001$), semantic memory, as measured using the verbal fluency FAS-Test ($p=0.009$), and on the Rivermead Behavioural Memory Test (RBMT) tests of immediate and delayed recall ($p=0.023$ and $p=0.026$, respectively).

Conclusion: This study of patients with end-stage osteoarthritis of the hip found that, six months after surgery, significant improvement was found in measures of immediate recall, delayed recall, visual construction, visual memory, and semantic memory.

Strahl, A., et al. Mid-term Improvement of Cognitive Performance after Total Hip Arthroplasty in Patients with Osteoarthritis of the Hip. A Prospective Cohort Study. **Bone**

Joint J. 2022, March. 104-B(3): 331-340.

DIRECT CURRENT STIMULATION FOR POST-CONCUSSION COGNITION

After a concussion, data suggest that 14% to 29% of youth will experience persistent post-concussion symptoms (PPCS). Among these are changes in performance on complex executive function tasks. As data suggest that transcranial direct current stimulation (tDCS) may induce improvements in working memory (WM), this study was designed to better understand the efficacy of tDCS for the treatment of youth diagnosed with PPCS.

The subjects were 13 to 18 years of age with a diagnosis of concussion at least one month before the study. All were still experiencing cognitive post-concussive symptoms. The subjects were randomized to a sham group or a treatment group to receive three days of anodal tDCS, delivered for 20 minutes at 1.5 milliamperes (mA) over the left DLPFC. Each participant completed the Wechsler Abbreviated Scale of Intelligence (WASI). Concurrent with tDCS administration, the patients received an auditory-visuospatial dual N-Back working memory (WM) task at four levels of difficulty (N-0, N-1, N-2, and N-3).

Compared to the sham group, the treatment group performed better on the N-Back level N2 on day two (p=0.019) and marginally better on Day three in level N3 (p=0.26). A comparison of symptoms, rated as non-, mild, moderate, considerable, or strong, found a trend toward more ratings of strong in the sham group. None of the subjects withdrew from the study due to the side effects of the intervention.

Conclusion: This study of 13 to 18-year-old patients with persistent post-concussive symptoms found that transcranial direct current stimulation can improve working memory, with improvement evident at the first treatment session.

De Launay, K., et al. The Effect of Transcranial Direct Current Stimulation on Cognitive Performance in Youth with Persistent Cognitive Symptoms Following Concussion: A Controlled, Pilot Study. **Brain Injury**. 2022. DOI: 10.1080/02699052.2022.2034179.

MUNIX TO ASSESS DISEASE PROGRESSION IN CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY

Chronic inflammatory demyelinating polyneuropathy (CIDP) includes a spectrum of well-defined autoimmune disorders. This study assessed the diagnostic utility of a new electrophysiologic index, (motor unit number index; MUNIX) for the sequential evaluation of patients with CIDP.

This prospective study included consecutive adult patients diagnosed with CIDP and seen in a neuromuscular clinic. All patients received the same treatment protocol, consisting of a combination of IVIg (2 g/kg for the first month, then by 1 g/kg monthly) and prednisolone (1 mg/kg per day, followed by gradual tapering). All patients were clinically assessed for functional capacity. Electrodiagnostic studies were completed with CMAPs, and SNAPs measured in upper and lower extremities. The MUNIX measurements were performed recording over the ADM, APB, and TA muscles on both sides. The tested muscles were assessed at five force levels, including 10%, 25%, 50%, 75%, and 100% of maximal force. The motor unit size index was calculated using the formula CMAP amplitude/MUNIX x 1000.

Data were completed from 416 patients. MUNIX scores correlated with strength and electrophysiological improvements in CIDP patients. Significant correlations were found between the baseline MUNIX sum score and the Medical Research Council Sum score (p=0.01), the six-month Overall Neuropathy Limitation Score (p=0.007), Rasch-built Overall Disability Scale (p=0.007), and the Nerve Conduction Study Sum Score (p=0.018).

Conclusion: This study suggests that the motor unit number index (MUNIX) may represent an objective outcome measure for follow-up in patients with chronic inflammatory demyelinating polyneuropathy.

Okhovat, A., et al. The Value of MUNIX as an Objective Electrophysiological Biomarker of Disease Progression in Chronic Inflammatory Demyelinating Polyneuropathy. **Muscle Nerve.** 2022, March; 64(4): 433-439.

SEX STEROID CONCENTRATIONS AND CARDIOVASCULAR EVENTS IN HEALTHY OLDER WOMEN

A number of researchers have proposed that low serum testosterone in women may be detrimental to their cardiovascular health. Studies of women younger than 70 years of age have provided conflicting results on this topic. The Sex Hormones in Older Women (SHOW) study was designed to establish the association between the concentration of circulating androgen and testosterone in the blood and the risks of major cardiovascular events and all-cause mortality among women 70 years of age or older.

The SHOW study is a cohort substudy of the ASPREE trial, which recruited 16,703 women, 70 years of age or older. From the ASPREE study, healthy women were selected, with blood samples drawn to evaluate levels of testosterone and SHGB (the main transport protein for sex steroids in the blood). The primary outcome measure was the association between the concentration of testosterone in the blood, risk of major adverse cardiovascular events (MACE), and all-cause mortality.

Data were analyzed for 5,535 women with a median age of 75 years and a median follow-up of 4.4 years. After adjusting for risk factors, serum testosterone concentrations in quartiles three and four were associated with a significantly lower incidence of a first-ever MACE than were concentrations in quartile one (p=0.02). Compared with quartile one, all higher quartiles of DHEA were associated with a significantly lower risk of MACE (p=0.04). In the adjusted models, no significant association was found between any hormone or SHBG and all-cause mortality.

Conclusion: This study of healthy women, 70 years of age or older, found that, compared to the lowest quartile of serum testosterone, higher levels were associated with a reduced risk of major, adverse, cardiovascular events.

Islam, R., et al. Associations between Blood Sex Steroid Concentrations and Risk of Major Adverse Cardiovascular Events in Healthy, Older Women in Australia: A Prospective, Cohort Substudy of the ASPREE Trial. **Lancet Healthy Longev.** 2022 Feb; 3(2): e109-e118.

GENICULATE NERVE BLOCK FOR OSTEOARTHRITIS OF THE KNEE

For individuals with osteoarthritis (OA) of the knee, pain remains the major reason for knee joint replacement. Among the newer interventions for this pain, radiofrequency ablation (RFA) of the genicular nerves has gained popularity as a non-operative intervention. This study further explored the effectiveness of genicular nerve RFA in alleviating pain and its effects on functional outcomes and quality of life.

Subjects were adults 50 years of age or older with knee OA, Kelgren grade II or III, and pain severity of at least four on a numerical rating scale. Those participants underwent ultrasound-guided ablation of the superior medial the inferior medial and the superior lateral genicular nerves. The primary outcome variable was self-reported pain, while secondary outcomes included assessments of pain, stiffness, and physical function measured with the Western Ontario and McMaster University's osteoarthritis index (WOMAC).

Of the patients who had positive responses to the lidocaine tests, 13 underwent RFA and were included in the study. The average NRS pain scores were 4.0 at baseline, 2.0 at two weeks (p=0.001), and 2.0 at 12 weeks (p=0.007 compared to baseline). Significant improvement was also noted in the physical health domain score of the SF-36 and in pain and stiffness domain scores of the WOMAC.

Conclusion: This study of patients with osteoarthritis of the knee found that genicular nerve radiofrequency ablation significantly improved pain and physical health scores

Chang, Y., et al. Functional Outcomes and Physical Performance of Knee Osteoarthritis Patients after Ultrasound-Guided Genicular Nerve Radiofrequency Ablation. **Pain Med.** 2022, February; 23(2): 352-361.

ASPIRIN FOR THROMBOEMBOLISM PROPHYLAXIS AFTER HIP ARTHROPLASTY

Symptomatic venous thromboembolism (VTE) is the fourth most common complication among patients undergoing surgical repair of a hip fracture. This study assessed the efficacy of aspirin compared with other anticoagulants for VTE prophylaxis.

This retrospective review included all patients at the author's institution undergoing total hip arthroplasty or hemiarthroplasty for femoral neck fracture from 2008-to 2018. Data harvested from the records included demographics, physical examination, history of embolisms, and hospital data. The final cohort included 361 patients undergoing hemiarthroplasty and 299 undergoing total hip arthroplasty. All patients received VTE prophylaxis with a single medication for 4-6 weeks. The risk of VTE was calculated with the high-risk patients (>80 percentile per risk calculation) excluded from the analysis. The primary outcome of interest was a symptomatic pulmonary embolism or deep venous thrombosis. The medications for prophylaxis included aspirin, 40.1%, warfarin 15.5 %, and low molecular weight heparin 23.41%, heparin 5.94% factor X inhibitors 12.87% clopidogrel 2.13%.

The rate of symptomatic VTE for the entire group undergoing hemiarthroplasty was 2.19% for the aspirin group and 6.33% for the non-aspirin group. The high-risk group had a significantly lower proportion of patients receiving aspirin compared with the standard-risk group. Excluding the high-risk group, there was no difference in the symptomatic VTE rates between the treatment groups.

Conclusion: This study of patients undergoing surgical repair of a hip fracture found that aspirin may be a safe and effective option for venous thromboembolism prophylaxis.

Emanuele, C., et al. Aspirin Is an Effective Prophylaxis for Venous Thromboembolism in Ambulatory Patients with Femoral Neck Fracture Undergoing Hip Arthroplasty. **J Bone Joint Surg.** 2022. DOI: 10.2106/JBJS.17.00253.

ELECTRIC SCOOTER INJURIES IN THE UNITED STATES

Since their introduction in 2017, standing electric scooters have dominated the shared micro-mobility market throughout the world. With their increasing popularity in use, the number of injuries resulting from scooter-related accidents has increased. This study used a large national surveillance system to better understand the frequency and severity of scooter-related injuries.

Data were collected from the National Electronic Injury Surveillance System (NEISS), a stratified probability sample of EDs within the US. Electric-scooter-related injuries were categorized into six groups including open wound/amputation, concussion/closed head injury, fracture, soft tissue injury, strain/sprain, and others. The body region of injury and age of the e-scooter rider were documented.

Between January 1, 2015, and December 31, 2019, an estimated 60,550 e-scooter related injuries were treated in the emergency departments in the US. The rate of e-scooter injuries per 100,000 population remained relatively stable from 2015 to 2017. Of these 18.6% involved a crash with a motor vehicle. Electric-scooter injuries involving motor vehicles primarily occurred in individuals ages 18 to 39 years (60.4%). Fractures and dislocations were the most commonly diagnosed injury, accounting for approximately 28.0%.

Conclusion: This study of electric scooter injuries found that the rate of injury was stable over the five years of the study and that injuries with accidents involving motor vehicles were more likely in younger riders, and more likely to result in hospital admission.

Neuroth, L., et al. Motor Vehicle Related Electric Scooter Injuries in the US: A Descriptive Analysis of NEISS Data. **Am J Emerg Med**. 2022, May;55:1-5.

GABAPENTIN FOR POST ARTHROPLASTY PAIN

Total joint arthroplasty (TJA) is among the most common elective surgical procedures in the United States. To address postoperative pain, many surgeons use multimodal analgesics including gabapentin. This study assessed the efficacy of gabapentin for postoperative pain.

Subjects were patients 18 to 85 years of age scheduled for elective knee or hip arthroplasty and expected to stay at least three days in the hospital. Subjects were randomized to receive either placebo or gabapentin 600 mg two hours before surgery and another within six hours and then every 12 hours for three additional days. As-needed medications included patient-controlled analgesia, intravenous (IV),

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and oral opioids. The two groups were compared by the cumulative opioid consumption and pain intensity scores in the first 72 hours, measured with a ten-point Numeric Rating Scale.

Data from 60 patients were available for the final analysis, with 28 (47%) randomized to gabapentin and 32 (53%) to placebo. The median 72-hour pain scores were 4.0 in the gabapentin and 4.1 in the placebo group. The 72-hour opioid consumption score differed by study site; at site one the median opioid consumption score was 33 for the gabapentin group and 24 for the placebo group. For site two the median opioid consumption was six in the gabapentin group and 25 in the placebo group. Neither reached statistical significance.

Conclusion: This small study of patients undergoing elective knee or hip arthroplasty failed to support the benefit of gabapentin for analgesia or opioid-sparing for acute postoperative pain.

Sabry, A., et al. Effects of Gabapentin Enacarbil on Postoperative Pain after Hip and Knee Arthroplasty: A Placebo -Controlled Randomized Trial. **Clin J Pain.** 2022, April; 38(4): 250-256.

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