Elias Perli, Class 2024

Campus: CHI-St Joseph Health Regional Hospital, Bryan, TX
Research Area: Urinary incontinence after spinal cord injury | Microglial Polarization into M1 and M2 Phenotypes: A New Mechanistic Target for Post-Traumatic Epilepsy Treatment
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Launch Talks: May 2021

Elias Perli, a medical student in the School of Medicine, is conducting a clinical research project investigating whether sildenafil may improve urinary leakage in patients with spinal cord injuries (SCI) under the guidance of Jonathan A. Friedman, MD, a neurosurgeon at The Texas Brain and Spine Institute (TBSI). Sildenafil is a phosphodiesterase type 5 (PDE5) inhibitor that stimulates vasodilation and is thought to function by increasing blood flow throughout the body. In previous studies in women with urinary incontinence, sildenafil decreased the number of urinary leaks they had per week. For this study, SCI patients will be recruited from Texas Brain and Spine Institute and/or CHI St. Joseph's Rehabilitation Hospital. The study scheme includes first, identifying potential subjects from the TBSI database and then performing a prescreening. Second, a first in-person visit for informed consent, medical screening, randomization, and baseline measures of subjects. Baseline measures include bladder diary, quality of life, and sildenafil drug levels. Once enrolled, patients will be randomly assigned to take either sildenafil (20 mg) or placebo. This study is anticipated to shed light on novel treatments to improve the quality of life of SCI patients suffering from urinary incontinence.

Elias Perli is also conducting a literature review research project investigating microglia polarization as a potential therapeutic target for post-traumatic epilepsy (PTE) due to traumatic brain injury (TBI) under the guidance of D. Samba Reddy, PhD, RPh, a Professor of Neuroscience and Experimental Therapeutics at the Texas A&M School of Medicine. Traumatic Brain Injury (TBI) is a change in normal brain function caused by an external insult. More than 3 million people in the United States suffer a TBI annually, accounting for around 300,000 hospitalizations and 50,000 fatalities per year. One notable sequela of TBI is PTE, a neurological disorder where late spontaneous recurrent seizures develop following a TBI. Epileptogenesis may begin after the TBI and become suppressed months/years after the brain insult occurred; potentially delaying diagnosis of PTE after the primary brain trauma. PTEs make up around 20% of symptomatic epilepsies, and 5-6% of all epilepsies in general. Current long-term PTE treatment is limited to the acute use of anti-epileptic drugs (AEDs), prompting the need to investigate non-neuronal targets/mechanisms other than ion channels, such as: microglia, enzymes, oxidative stress molecules, and genetics. This research will investigate the role of microglial

polarization into M1 (pro-inflammatory) and M2 (anti-inflammatory) phenotypes in neuroinflammation, as seen in PTE, and its potential as a new therapeutic target on PTE's chronic inflammation and long-term treatment.