Novel Therapeutic Intra-Arterial Pharmacotherapy Administration for Treatment of Acute Ischemic Stroke

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Stroke is the 5th leading cause of death in Kentucky and the United States as well as the leading cause of long-term disability in several countries. Despite its vast implications, there is currently no treatment for stroke that can bring a patient's condition back to his/her pre-stroke function. The purpose of my experiment was to investigate whether verapamil, a calcium channel blocker, would decrease the infarcted region of the brain and improve functional outcome when administered intra-arterially (IA) to the ipsilateral side of a stroked mouse brain. I worked with verapamil-treated (treated group) and saline-treated (control group) C57/Bl6 mice brain tissue. I conducted three experiments with the tissue to determined the effects of verapamil on neuroprotection. First, I used immunohistochemistry to stain the tissue for NeuN, a marker for mature neurons. I also ran western blots to determine the concentrations of HIF-1a protein in the tissue. Lastly, I stained the brain tissue with TTC to measure the infarct volumes. Additionally, I was given the data from rotor rod and open field behavioral studies. I compiled the data, and compared the motor movement performances of the control and treated mouse groups. After analyzing both behavior tests and all three neuroprotection tests using t-tests, I was able to show a significant difference between the control and treated groups, with verapamil having a positive effect. In conclusion, verapamil proves to be a strong candidate for the treatment of acute ischemic stroke. Verapamil is currently in Phase I clinical trials and is showing success.