Prophylactic Biochanin A Induces GOT Expression and Protects Against Acute Ischemic Stroke

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Stroke is the leading cause of disability and the fourth leading cause of death in the US. Acute Ischemic Stroke accounts for 80% of cases in adult stroke victims. In this context, the present research aims to reduce the devastating effects of acute ischemic stroke. Our project consisted of four parts, utilizing a mouse model. The first component involved laser capture microdissection (LCM) of neurons from stroke-affected mice to determine the effects of biochanin A supplementation on GOT mRNA expression. The second component involved the immunohistochemical determination of GOT protein expression in response to biochanin A supplementation. The next facet employed Digital Imaging and Communications in Medicine (DICOM) image analysis of post stroke MRI to determine lesion volume. The final element was behavioral analysis, a study of sensorimotor outcomes at 48-hrs post-stroke. LCM/cDNA synthesis/Real-time PCR showed a statistically significant increase in GOT mRNA expression with the 5 mg/kg biochanin supplementation. Immunohistochemistry demonstrated proliferation of GOT protein expression as the control to 5 mg/kg biochanin supplementation group displayed an increase of almost 80% more expression within the stroke injury. The MRI tracings yield lesion volumes consistent with the positive effects of biochanin A supplementation as they show a 54% increase in tissue protection. Behavioral analysis further emphasized the protective properties of biochanin A through functional indicators such as distance travelled, total time mobile, and speed. In fact, total time mobile increased by about 30 seconds (during a 5-minute period) with supplementation. All aspects of our study indicated that GOT expression and stroke protection increased with biochanin supplementation.

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