The Use of Endogenous Antioxidant Proteins for a Novel Stroke Treatment

Researchers at the University of South Florida have developed a novel method of post-stroke treatment using human umbilical cord blood cells.

In the United States, strokes affect approximately 800,000 people per year and are estimated to be the third leading cause of death annually. Unfortunately, there is currently only one FDA-approved treatment available for stroke victims, but must be administered shortly after the stroke occurs to improve recovery.

Oligodendrocytes (OLs), which are the main cell type found in central nervous system white matter, are essential for the survival and function of neurons. However, minimal research has been conducted involving the relationship between strokes and OL dysfunction.

USF researchers have found that the systematic infusion of human umbilical cord blood (HUCB) cells 24 to 48 hours after a stroke is an effective treatment in animal models, decreasing injury to the brain by 80%. HUCB cells are known to contain leukemia inhibitory factor (LIF), which has ischemia-reducing properties. Cultures treated with HUCB cells showed an increase in gene expression associated with OL functions. Furthermore, endogenous antioxidant protein expression in OLs and neurons were upregulated with HUCB administration. The application of HUCB cells and the induced upregulation of these key antioxidants may be used as a therapy for stroke victims. Furthermore, LIF may be utilized clinically to potentially expand the therapeutic window for stroke treatment, thereby increasing patient access to post-stroke treatment.

ADVANTAGES:
- Effective post-stroke treatment
- HUCB cells upregulate antioxidant protein expression
- Protects oligodendrocytes from ischemia

HUCB Treatment Significantly Reduced Infarct Volume Relative to the Control Group in Animal Models