Progesterone and Vitamin D Combination in the Treatment of Ischemic Stroke

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Technology description

Technical Summary

Emory University researchers have discovered that Vitamin D provides valuable neuroprotective effects, spurring the development of improved hormone therapies for the treatment of traumatic brain injuries. When used in combination with current Progesterone therapies, the pleiotropic effects of both hormones stimulate different anti-inflammatory and pro-survival pathways; these act to inhibit the production of damage inducing cytokines while promoting neurogenic growth. Significant improvements in survival, cell death, and behavior are observed in rodent models of ischemic stroke receiving both Progesterone and Vitamin D when compared to either hormone alone. Because both hormones have high safety profiles, affect multiple neuroprotective signaling mechanisms, and are easy and inexpensive to administer, the combination of Progesterone and Vitamin D is a novel and compelling approach to the treatment of traumatic brain injuries.

Although Progesterone monotherapy shows promise in the treatment of many instances of traumatic brain injury, it is less effective in animal models that are Vitamin D deficient. As an estimated 1 billion of the world's population and upwards of 80% of the elderly are Vitamin D deficient, combinatorial neurological repair therapy involving Vitamin D is expected to significantly improve patient outcome in these individuals. The novel neuroprotective role of Vitamin D and its potentiation of Progesterone therapy provides the ability to overcome the heterogeneity of traumatic brain injuries, and offers a treatment that is effective for the entire population.

Traumatic brain injuries affect approximately 2 million in the U.S. each year, with no effective treatment currently available.

Application area

Novel combinatorial therapy that improves prognosis associated with traumatic brain injury.

Advantages

Improved neuroprotection over progesterone monotherapies.

Pleiotropic effects target multiple facets of the cell survival pathway.

Institution

Emory University

Inventors

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