Endocrinology-2013

OMICS Group Conferences
Accelerating Scientific Discovery

World Congress on
Endocrinology

August 26-28, 2013 Raleigh, North Carolina, USA

Efficacy of estrogen in experimental spinal cord injury

Naren L. Banik
Medical University of South Carolina, USA

Abstract

Spinal cord injury (SCI) is devastating and debilitating and, depending on the severity of injury, can lead to loss of neurological function, sphincter dysfunction, and paralysis. Healthy young adults are often affected, and there is no cure. The only treatment currently available is the use of methylprednisolone (MP) with limited efficacy. Therefore, new therapies must be developed and/or tested to protect cells and their processes for improvement/recovery of function. We have previously shown that use of high does estrogen (17β-estradiol) provided neuroprotection and improved locomotor function in experimental SCI in rats. Since this dose of estrogen (4 mg/kg) will never be used in clinics, the efficacy of low doses of estrogen (1-10 µg/kg) was tested in both acute and chronic animals following injury. Our findings in acute SCI indicated attenuation of astrogliosis, microgliosis, and inflammation and protection of cells, which were correlated with reduction of the expression of death genes Bax/Bcl2. This work was extended to chronic SCI studies (4-6 weeks) with administration of 10ug/kg estrogen given intravenously. Like the acute, analysis of tissue samples from chronic studies demonstrated reduction of inflammation and astroglial/microglial activation, promotion of microvessel growth, protection of neurons and oligodendrocytes, and preservation of axons. Locomotor function, as assessed using the BBB scale, demonstrated improvement at 4-6 weeks post-injury. These studies suggest that estrogen, by modulating different destructive pathways, has potential as an agent for treatment of individuals with SCI.
Supported by grants from NIH and VA.

Biography

Dr. Banik received Ph.D. from the University of London and did his postdoctoral studies at the Institute of Neurology, London. He is currently a professor in the Department of Neuroscience, Medical University of South Carolina and the Ralph H. Johnson Veterans Administration Hospital. He has served on NIH study sections and editorial boards of several neuroscience-related journals. His work has been supported by NIH and VA over the years. He has published over 200 papers in reputed journals and serves as Associate Scientific Director of the State of South Carolina Spinal Cord Injury Research Fund.