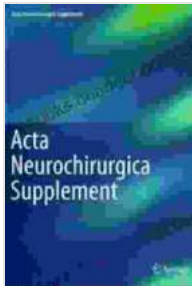


Current Progress In The Understanding Of Secondary Brain Damage From Trauma



Current Progress in the Understanding of Secondary Brain Damage from Trauma and Ischemia: Proceedings of the 6th International Symposium: Mechanisms of ... (Acta Neurochirurgica Supplement Book 73)

★★★★☆ 4.1 out of 5

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Print length : 128 pages



Secondary brain damage from trauma is a major cause of morbidity and mortality. In recent years, there has been significant progress in our understanding of the mechanisms of secondary brain damage. This article reviews the current state of the science and discusses the implications for clinical practice.

Mechanisms of Secondary Brain Damage

Secondary brain damage is a complex process that involves a number of different mechanisms. These mechanisms can be divided into two main categories: excitotoxicity and oxidative stress.

Excitotoxicity

Excitotoxicity is a process that occurs when neurons are exposed to high levels of excitatory neurotransmitters, such as glutamate. These neurotransmitters bind to receptors on the surface of neurons, causing an influx of calcium ions. This influx of calcium ions can lead to a number of cellular changes, including the production of free radicals, the activation of enzymes that break down the cell, and the death of the cell.

Oxidative Stress

Oxidative stress occurs when there is an imbalance between the production of free radicals and the body's ability to neutralize them. Free radicals are molecules that have unpaired electrons. These electrons can react with other molecules in the cell, causing damage to proteins, lipids, and DNA. Oxidative stress can lead to a number of cellular changes, including the death of the cell.

Clinical Implications

The understanding of the mechanisms of secondary brain damage has led to a number of new treatments for this condition. These treatments include:

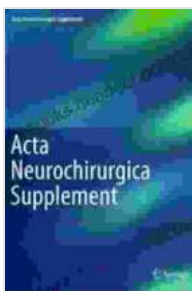
- Neuroprotective agents: These agents are designed to protect neurons from excitotoxicity and oxidative stress. Some neuroprotective agents that have been shown to be effective in clinical trials include:
 - N-methyl-D-aspartate (NMDA) receptor antagonists
 - Alpha2-adrenergic receptor agonists
 - Calcium channel blockers
- Antioxidant therapy: Antioxidants are substances that neutralize free radicals. Some antioxidants that have been shown to be effective in

clinical trials include:

- Vitamin E
 - Vitamin C
 - Coenzyme Q10
-
- Hypothermia therapy: Hypothermia therapy involves cooling the body to a temperature of 32-34 degrees Celsius. This cooling has been shown to reduce the production of free radicals and protect neurons from excitotoxicity.
 - Surgery: Surgery may be necessary to remove blood clots or other debris from the brain. Surgery may also be necessary to relieve pressure on the brain.

Future Directions

There is still much that we do not know about secondary brain damage from trauma. However, the progress that has been made in recent years has given us a better understanding of this condition and has led to the development of new treatments. As our understanding of secondary brain damage continues to improve, we can expect to see even more effective treatments for this condition in the future.



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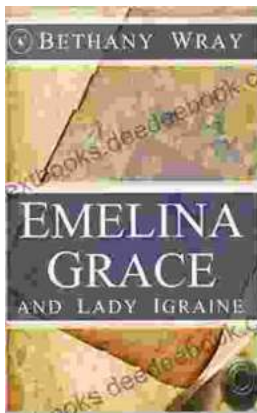
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