Estrogen hormone reveals protective ability after traumatic brain injury

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With more than 1.7 million people sustaining a traumatic brain injury each year, the need to identify processes to limit inflammation and subsequent damage is critical. Approximately 275,000 people are hospitalized annually with traumatic brain injury, leaving 85,000 with long-term disabilities and taking the lives of more than 50,000. More than 5 million people live with disabilities caused by traumatic brain injuries, often the result of car accidents and falls. Direct and indirect costs exceed $75 billion.

Dr. Joshua Gatson, Assistant Professor of Surgery at the University of Texas Southwestern Medical Center in Dallas, investigates biomarkers and novel therapies for traumatic brain injury. His previous work has shown that estrone, one of the three naturally occurring estrogen hormones in the body, has shown some promise in reducing inflammation and cell death in the brain. His latest study is the first to demonstrate estrone provides those anti-inflammatory and antioxidant capabilities after traumatic brain injury. It is likewise the first to reveal the cellular pathways that are involved. His findings were presented April 22, 2012 during Experimental Biology 2012 in San Diego, CA.

The study, conducted in male rats, compared 0.5 mg of estrone to a placebo, both given 30 minutes after the injury. It demonstrated that estrone is involved in promoting brain-derived neurotrophic factor (BDNF), which promotes cell survival. "BDNF, one of the main growth factors that regulates repair following injury, is actually increased following treatment with estrone after brain injury," said Gatson, who

administered the injections within 30 minutes of the injury. "So if you give this drug shortly after injury, it is thought to increase repair mechanisms."

Most research involving protective capabilities of estrogen have focused instead on estradiol, one of the other two types of estrogen hormones, Dr. Gatson noted, so this finding indicates a fresh avenue for future study.

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