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**Emergency treatment guidelines improve survival of people with severe head injury**

Maryland

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A large study of more than 21,000 people finds that training emergency medical services (EMS) agencies to implement prehospital guidelines for traumatic brain injury (TBI) may help improve survival in patients with severe head trauma. The findings were published in JAMA Surgery, and the study was supported by the National Institute of Neurological Disorders and Stroke (NINDS), part of the National Institutes of Health (NIH).

"This demonstrates the significance of conducting studies in real-world settings and brings a strong evidence base to the guidelines," said Patrick Bellgowan, Ph.D., programme director at NINDS. "It suggests we can systematically increase the chances of saving lives of thousands of people who suffer severe traumatic brain injuries."

Based on scores of observational studies, guidelines for prehospital management of TBI that were developed in 2000, and updated in 2007, focused on preventing low oxygen, low blood pressure, and hyperventilation in people with head injury. Collectively, the studies suggested that controlling those factors before patients arrived at the hospital could improve survival, but actual adherence to the guidelines had not been examined.

The Excellence in Prehospital Injury Care (EPIC) Study, led by Daniel Spaite, M.D., professor of emergency medicine at the University of Arizona in Tucson, trained EMS agencies across Arizona in the TBI guidelines and compared patient outcomes before and after the guideline implementation. All patients in the study experienced head injury with loss of consciousness. This public health initiative was a collaboration between the university and the Arizona Department of Health Services. The EPIC study is the first time that the guidelines were assessed in real-world conditions.

The results showed that implementing the guidelines did not affect overall survival of the entire group, which included patients who had moderate, severe, and critical injuries. However, further analysis revealed that the guidelines helped double the survival rate of people with severe TBI and triple the survival rate in severe TBI patients who had to have a breathing tube inserted by EMS personnel. The guidelines were also associated with an overall increase in survival to hospital admission.

"We found a therapeutic sweet spot and showed that the guidelines had an enormous impact on people with severe TBI. The guidelines did not make a difference in the moderate TBI group because those individuals would most likely have survived anyway and, unfortunately, the extent of injuries sustained in many critical patients was too extreme to overcome," said Dr. Spaite.

Bentley Bobrow, M.D., professor of emergency medicine at the University of Arizona and co-principal investigator for the study said, "It was exciting to see such dramatic outcomes resulting from a simple two-hour training session with EMS personnel."

Although the guidelines provide specific recommendations for oxygen levels and blood pressure, researchers will examine whether those ranges should be revised. More research is needed to determine the best strategies for airway management and breathing support to optimize ventilation. Additional studies will investigate the best methods for national and global adoption of the TBI guidelines.

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