

Study shows ketamine could be beneficial for treating brain injury in children

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A common anesthesia drug could be beneficial in reducing pressure inside the skull of children with traumatic brain injuries (TBI), according to a study published in *Critical Care Medicine*.

Ketamine, a drug that has been used for anesthesia since the 1970s, has traditionally been avoided for patients with TBI due to [early studies](#) suggesting that it could raise the pressure inside of the skull, known as [intracranial pressure](#) (ICP).

More recent studies have suggested otherwise, said lead author Michael Wolf, MD, assistant professor of Pediatrics and Neurological Surgery and director of Neurocritical Care at Monroe Carell Jr. Children's Hospital at Vanderbilt.

Wolf and his co-authors set out to reexamine the effects of ketamine on ICP in children admitted to the [pediatric intensive care unit](#) (PICU) with severe TBI, analyzing data from 33 patients ages 1 month to 16 years, 22 of whom received ketamine as part of a treatment protocol informed by evidence-based guidelines.

Eighteen ketamine doses were given during ICP crises in 11 patients, and an overall decrease in ICP was observed.

"We found that not only does ketamine not raise ICP, in some cases it may even lower it," Wolf said. "Children with severe TBI are at risk of dying or having long-term neurologic impairment, such as difficulty walking and talking. In the crucial days following their initial injury, our focus in the PICU is to minimize ongoing damage to their brains, with a focus on preventing and treating high ICP."

"Despite decades of research, our [treatment options](#) remain limited to a handful of medicines and techniques," he added. "This study might help open the door to a new use of an old drug that could help us continue to improve our approach to caring for these [vulnerable children](#)."

Wolf said study the results are "exciting, though preliminary" because ketamine was associated with a reduction in ICP during ICP crises. If the

findings are reproduced in a larger study, ketamine may warrant consideration as a treatment for intracranial hypertension in children with severe TBI, he said.

"Going forward, we plan to study the effects of ketamine in larger numbers of children with traumatic brain injury, partnering with colleagues at other children's hospitals to do so," Wolf said. "If we are able to improve our understanding of ketamine's effects in a larger study, we might find that ketamine represents another tool to provide the best possible treatment for [children](#) with [traumatic brain injury](#)."

The study results could reverse nearly two decades of thinking related to ketamine and intracranial pressure, according to co-author John C. "Jay" Wellons, III, MD, MSPH, Cal Turner Chair and chief of Pediatric Neurosurgery at Monroe Carell.

"This is a terrific example of what the pediatric neurocritical care effort is capable of," Wellons said. "Dr. Wolf and his pediatric ICU colleagues not only provide excellent care, but also conduct field-impacting clinical research.

"This study alone represents a near complete reversal in how we think about the relationship between [ketamine](#) and intracranial pressure. The results will likely lead to further studies that I believe will change 20 years of past thinking," he said.

More information: Jennifer C. Laws et al, Acute Effects of Ketamine on Intracranial Pressure in Children With Severe Traumatic Brain Injury, *Critical Care Medicine* (2023). [DOI: 10.1097/CCM.0000000000005806](#)

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