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Hospitals' compliance with guidelines for treating brain injuries doesn't guarantee better outcomes

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Credit: Anne Lowe/public domain

Two decades ago, the Brain Trauma Foundation published its first set of guidelines for treating traumatic brain injury.

Now, a study by the Los Angeles County Trauma Consortium—which includes several physicians from UCLA—has found that compliance

with those guidelines doesn't necessarily translate into better results for patients.

In research published online by the peer-reviewed journal *JAMA Surgery*, the consortium analyzed 2009 and 2010 data from all 14 L.A. County trauma centers and found no evidence that compliance with the guidelines led to lower mortality rates.

"There is no direct connection between the rate at which a hospital does what it is supposed to do for traumatic brain injury patients and how likely their patients are to die from their injuries after we adjust for other important patient characteristics," said Dr. Aaron Dawes, the study's lead author and a resident in general surgery at the David Geffen School of Medicine at UCLA.

The consortium is made up of health services researchers from UCLA and the University of Southern California, and representatives of the trauma centers and the county's Emergency Medical Services Agency.

Researchers calculated how often trauma centers follow the guidelines, which include management strategies and specific criteria for use of two invasive procedures—intracranial pressure monitoring and craniotomy.

Intracranial pressure monitoring involves drilling a small hole in the skull in order to insert a specialized device that can directly monitor for pressure building up against the brain. The device can alert doctors to rising intracranial pressure before it can cause brain damage or death. Craniotomy, the surgical removal of part of the skull, can be used either to help relieve this pressure or to treat intracranial bleeding, which causes elevated intracranial pressure and can lead to death if left untreated.

The researchers analyzed data from 734 adults who sustained severe

traumatic brain injury. They found:

- The percentage of patients who died from their injuries varied by medical center, but ranged from 20 percent to 50 percent.
- Risk-adjusted mortality rates—which take into account the patients' age and other medical conditions—ranged from 24.3 percent to 56.7 percent.
- Only 46.1 percent of patients whose injuries called for intracranial pressure monitoring according to the guidelines actually underwent monitor placement, and only 45.6 percent of the patients whose injuries called for craniotomy underwent the procedure.
- Hospitals' compliance with the guidelines ranged from 9.6 percent to 65.2 percent for intracranial pressure monitoring, and from 6.7 percent to 76.2 percent for craniotomies.

"Overall, patients received the procedures recommended by the guidelines only about half the time—and even less at some centers," Dawes said. "This tells us that we need to do a better job providing evidence-based care, but it also showed that the pattern of how often hospitals follow the guidelines does not appear to be associated with other, more validated measures of hospital quality.

"All hospitals need to improve, but our findings show that simply getting them to follow the guidelines more closely might not necessarily lead to better outcomes for patients."

The researchers suggest that the study highlights a key problem with the trauma foundation guidelines: They address only whether intracranial monitoring should be performed, but not how the clinical team should use the information that the monitors provide.

"For example, two identical patients could have monitors placed," said

Dawes, a Robert Wood Johnson Foundation Clinical Scholar. "But one patient's medical team might not use information from the monitor—or might not use it as well as the other patient's team. Blunt metrics like the ones we studied simply can't get at that level of clinical decision-making."

These findings already have prompted consortium members to re-evaluate how they treat brain trauma, which could lead to better care for Los Angeles patients, Dawes said.

"Forming this consortium and working together on these issues has created a framework for quality improvement throughout the county," he said. "Its most important contribution has been getting the entire trauma system to start talking about quality and how to improve it."

There were some limitations to the study. It included only patients with the most severe traumatic brain injuries in Los Angeles County, so the results may not apply to other regions or people with less severe injuries. Also, practices at some medical centers might have changed during the time between data collection and data analysis. Finally, the sample size at some hospitals was too small to make certain comparisons.

"Despite improvements in care, mortality from [traumatic brain injury] remains both common and variable from hospital to hospital," the study stated. "Our results demonstrate no association between hospitals' compliance with two [Brain Trauma Foundation] guidelines and risk-adjusted mortality, suggesting that neither measure should be used as an independent marker of hospital quality."

More information: "Compliance With Evidence-Based Guidelines and Interhospital Variation in Mortality for Patients With Severe Traumatic Brain Injury." *JAMA Surg*. Published online July 22, 2015. DOI: 10.1001/jamasurg.2015.1678

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