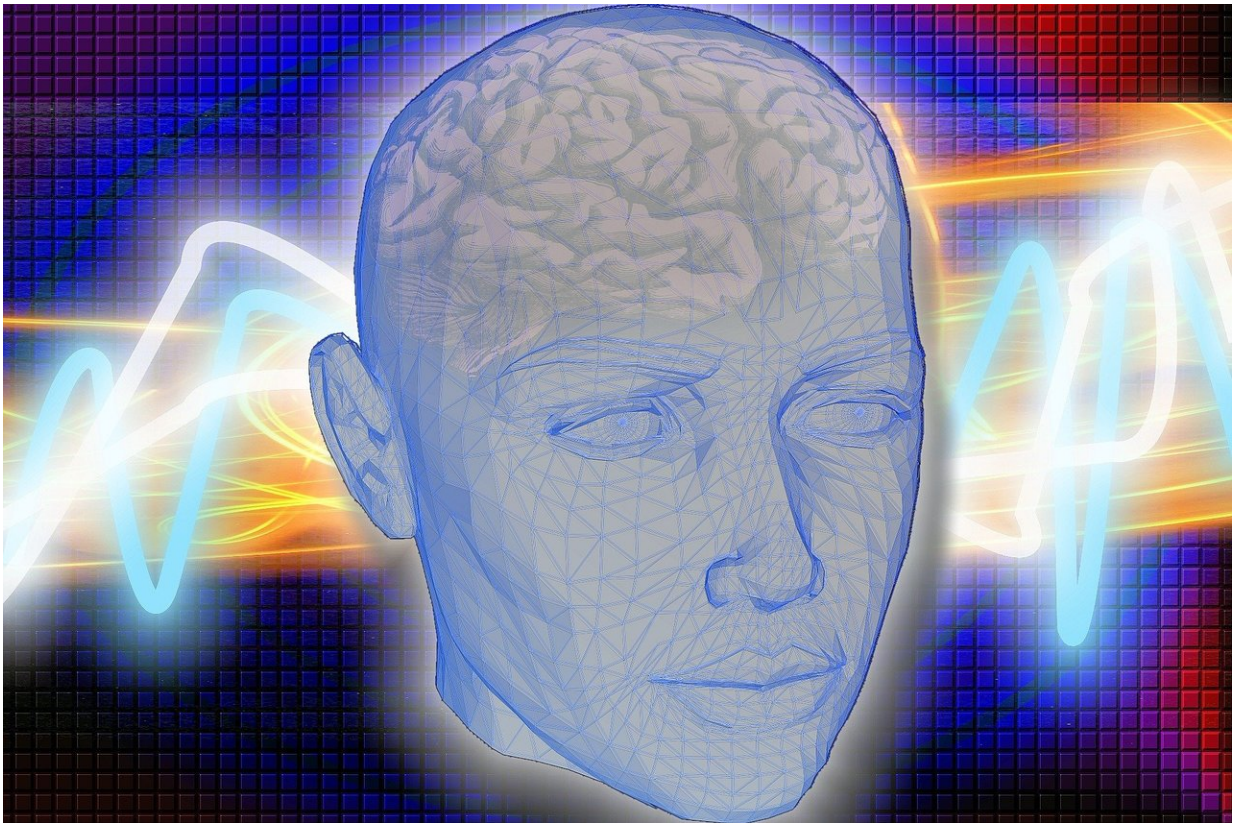


Kidney injury in diabetic ketoacidosis linked to brain injury

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Researchers from a consortium of hospitals including Children's Hospital of Philadelphia (CHOP) have identified factors that make children with diabetic ketoacidosis more likely to experience acute

kidney injury. Analyzing data from a large, multicenter clinical trial, the researchers also found that children who experience acute kidney injury are more likely to also experience subtle cognitive impairment and demonstrate lower IQ scores, suggesting a pattern of multiple organ injury. The findings were published online today in *JAMA Network Open*.

Multiple recent studies have shown that organ injuries in children with [diabetic ketoacidosis](#) occur more frequently than previously thought. One recent retrospective study found that acute [kidney](#) injury commonly occurs in these children. Earlier analysis of a large, multicenter study demonstrated cerebral injury commonly occurs in diabetic ketoacidosis. Together, these studies raised the possibility of an underlying pathophysiology that connects these injuries across the body if the presence of these injuries were linked in patients.

"We wanted to look at these issues in a more prospective manner," said Sage Myers, MD, an attending physician in the Emergency Department at CHOP and first author of the study. "With 13 participating emergency departments in the Pediatric Emergency Care Applied Research Network, we had the ability to not only study the frequency of acute kidney injury in these children, but also the underlying factors associated with injury and whether there is an association between the occurrence of acute kidney injury and cerebral injury, which would suggest a possible linkage between the mechanisms of injury underlying both."

The researchers studied 1,359 episodes of diabetic ketoacidosis in children. Acute kidney injury occurred in 584 (43%) of those episodes, and 252 of those episodes (43%) were classified as either stage 2 or 3, representing more severe cases of kidney injury. When assessing whether [acute kidney injury](#) was associated with cognitive issues, children with kidney injuries had lower scores on short-term memory tests during diabetic ketoacidosis, as well as lower IQ scores three to six

months after recovering from the condition. These differences persisted after adjusting for the severity of diabetic ketoacidosis and demographic factors like [socioeconomic status](#).

"If we can identify the mechanisms of kidney [injury](#) after diabetic ketoacidosis, it can help in the development of new therapeutic and preventive strategies," said Nathan Kuppermann, MD, professor and chair of emergency medicine at UC Davis Health, and senior author and co-principal investigator of the study. "We're also hoping to focus future research on how diabetic ketoacidosis causes simultaneous, multi-organ injuries such as what we demonstrated in this study."

More information: Myers et al, "Acute Kidney Injury During Diabetic Ketoacidosis in Children: Frequency, Risk Factors, and Association with Neurocognitive Outcomes." *JAMA Network Open* (2020). [DOI: 10.1001/jamanetworkopen.2020.25481](https://doi.org/10.1001/jamanetworkopen.2020.25481)

Provided by Children's Hospital of Philadelphia

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