

Do non-steroidal anti-inflammatory drugs cause kidney failure in children?

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Sick children, especially those with some dehydration from flu or other illnesses, risk significant kidney injury if given drugs such as ibuprofen and naproxen, Indiana University School of Medicine researchers said Friday.

In an article published online Jan. 25 by the *Journal of Pediatrics*, Jason Misurac, M.D., and colleagues from IU and Butler University reported that nearly 3 percent of cases of pediatric acute kidney injury over a decade could be traced directly to having taken the common nonsteroidal anti-inflammatory drugs, or NSAIDs.

Although relatively few in terms of percentage of total kidney damage cases, the children with problems associated with NSAIDs included four young patients who needed dialysis, and at least seven who may have suffered permanent kidney damage, the researchers said.

"These cases, including some in which patients' kidney function will need to be monitored for years, as well as the cost of treatment, are quite significant, especially when you consider that alternatives are available and acute kidney injury from NSAIDs is avoidable," Dr. Misurac, a fellow in pediatric nephrology, said.

Although such drugs have been linked to kidney damage in small, anecdotal reports, the study reported Thursday is believed to be the first large-scale study of the incidence and impact of acute kidney injury caused by NSAIDs.

The research team evaluated medical records at Riley Hospital for Children at IU Health in Indianapolis from January 1999 through June 2010 and found 1,015 cases in which patients had been treated for acute kidney injury from any cause.

After excluding cases in which the acute kidney injuries could possibly be explained by other factors, such as diseases affecting kidney function, the researchers found 27 cases, or 2.7 percent, in which the only factors were the administration of NSAIDs. In nearly all cases, the NSAIDs were administered before the children were admitted to the hospital. Because many of the 1,015 cases involved multiple potential causes of acute kidney injury, the researchers said the 27 cases are likely an underestimate of the number of cases in which NSAIDs contributed to the kidney damage.

Among the researchers' findings:

- Most of the children had been treated with recommended dosages.
- All of the children under the age of 5 needed to undergo dialysis temporarily, were more likely than the older children to be placed in an intensive care unit and needed longer hospital stays.
- The average cost for hospital and kidney specialist fees in the 27 cases was nearly \$13,500, and the costs were much higher for younger children. At least \$375,000 was spent on the NSAID-associated kidney injury cases at Riley Hospital over the study period, the researchers said, but billing data for other specialists were not available in the database, suggesting that the actual costs were likely much higher.

NSAIDs affect kidney function by restricting blood flow to the blood-filtering components of the kidneys, which suggests the risks from the

drugs are greater among children who are dehydrated due to the effects of their illness, such as vomiting or diarrhea, Dr. Misurac said.

Fever is normal during an infection and not in itself dangerous, he noted, so "one alternative to NSAIDs would be acetaminophen, but another alternative would be no medication at all, at least for a while, to let the body fight the infection."

More information: "Non-steroidal Anti-inflammatory Drugs Are an Important Cause of Acute Kidney Injury in Children," by Jason M. Misurac, MD, Chad A. Knoderer, PharmD, Jeffrey D. Leiser, MD, PhD, Corina Nailescu, MD, Amy C. Wilson, MD, and Sharon P. Andreoli, MD, appears in *The Journal of Pediatrics*, [DOI 10.1016/j.jpeds.2012.11.069](https://doi.org/10.1016/j.jpeds.2012.11.069)

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