

## Letter to Editor



# Gastrointestinal Bleeding and Hepatotoxicity: Acetaminophen and Ibuprofen Home Medication Administration Errors in Fever Treatment of Children

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### To Editor,

Fever is the most common symptom of the disease in children, and seizures caused by fever are among the most common complications in children between 5 months and 6 years old.<sup>1</sup>

Sometimes to break a fever, doctors prescribe the oral liquid formulation of acetaminophen and ibuprofen, which have similar antipyretic effects on controlling fever.<sup>2</sup> After that, medication administration to the child is continued at home by the child's caregiver (e.g., parents or family members). Meanwhile, home medication administration by caregivers for fever treatment in children is associated with errors,<sup>3</sup> which can lead to serious complications, such as gastrointestinal bleeding and hepatotoxicity.<sup>4,5</sup>

In fact, in most cases, caregivers of feverish children are worried about fever due to the fear of febrile seizure or the failure to reduce fever despite administering medicine. To reduce fever in a hurry, they increase the dose of medicine used in different ways, such as increasing the amount of medicine, increasing the frequency of medication administration (the time interval between each medication administration was less than 4 hours), or taking both ibuprofen and acetaminophen simultaneously by increasing the amount of one of these two medicines. Unaware of the fact that haste makes waste and causes overdose and serious side effects in children.<sup>2</sup>

As a faculty member of the pediatric nursing department with more than 19 years of clinical nursing experience in various pediatric wards (emergency, internal, infectious, PICU, NICU, oncology, surgery, and neurology), after taking history from caregivers of children with treatment-resistant fever who were admitted to the hospital due to the side effects of acetaminophen and ibuprofen abuse,

such as elevated liver enzymes and gastrointestinal bleeding, I realized that the causes of caregivers' errors are rooted in issues that can be solved by educating them. These issues include the following: lack of knowledge of caregivers about weight-based dosing of ibuprofen and acetaminophen (e.g., taking the medicine with the previous amount prescribed by the doctor despite the change in the child's weight, which causes a lack of fever reduction); lack of knowledge of the maximum daily dose of ibuprofen and acetaminophen; lack of access to a pictographic dosing diagram on the medicine bottle label; low health literacy/a low literacy and most importantly, availability of acetaminophen and ibuprofen as over-the-counter (OTC) medications. Considering that caregivers are in contact with medical staff in two places, medical centers, and pharmacies, these two places are bottlenecks that should be given more importance when educating caregivers and adjusting the amount of medicine.<sup>5</sup>

In medical centers, nurses and doctors play their role by educating caregivers on the necessary knowledge about using ibuprofen and acetaminophen. So, the educational items should be included: the dose of medicine, intervals of use, maximum daily dose, adjustment of the dose based on the weight of the child, medication purpose, not taking both acetaminophen and ibuprofen and the role of pharmacists as consultants. The second bottleneck is pharmacies, which are considered more important areas than medical centers because caregivers go to pharmacies either to obtain medicine via doctor's prescription or as OTCs. In the first case, by asking the caregivers about the child's weight, pharmacists can double-check the dose prescribed by doctors.<sup>3</sup> Additionally, because pharmacists are trained to play the role of consultants in the selection and use of OTC medications,<sup>6</sup> they can determine the

dose of these medicines according to the child's weight and provide the necessary education to the caregivers.<sup>3</sup>

Ultimately, it should be mentioned that caregivers' lack of knowledge about the necessary information about taking acetaminophen and ibuprofen at home leads to medication errors related to the excessive use of these two medicines and complications of liver toxicity and gastrointestinal bleeding in children. Therefore, to prevent such home medication administration errors by caregivers, pharmacists, nurses, and doctors must educate caregivers about dosage control and 7 essentials of self-inflicted use of acetaminophen and ibuprofen in public media, children's clinics, hospitals, and pharmacies.

#### Authors' Contribution

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