

You Gave How Much Tylenol?

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Introduction

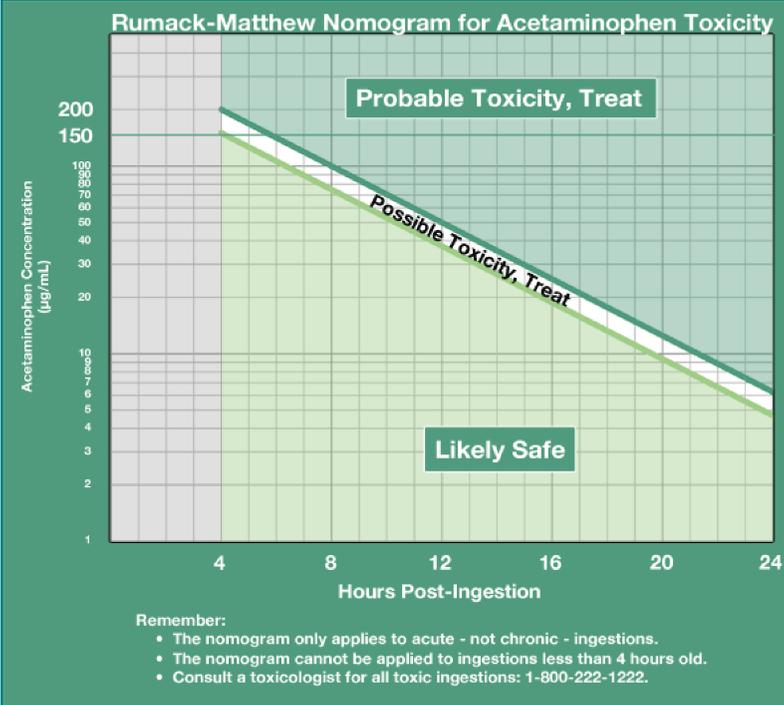
We present a case of intravenous acetaminophen (Ofirmev®) overdose in a healthy 2-year-old male weighing 11.6 kg.

Case Presentation

The patient presented with a Type II left supracondylar humerus fracture. He was taken to the OR for closed reduction and percutaneous pinning. After an uneventful general anesthetic, he was transferred to recovery, where he was scheduled to receive a one-time dose of 174 mg (15 mg/kg) of Ofirmev® delivered via syringe pump.

Due to a pump error, the patient instead received 1,000 mg (86.2 mg/kg). The Poison Control Center was contacted. They advised that because the dosage was less than the toxic amount of 200 mg/kg/24h, he would likely not need to be treated with antidote (N-acetylcysteine [NAC]). Also, the provider was advised to not give any additional doses of Ofirmev® over the next 24 hours.

Three and a half hours after overdose, the patient's serum acetaminophen level was 28 µg/ml, which was actually within the therapeutic range of 10-30 µg/ml, below the toxic level of 150 µg/ml. The patient was admitted overnight for observation. He did not develop any signs or symptoms of toxicity (e.g. abdominal upset or pain, nausea, vomiting, decreased oral intake, jaundice, diarrhea, convulsions). Liver function and coagulation tests the following morning were within normal limits. The patient was subsequently discharged home.



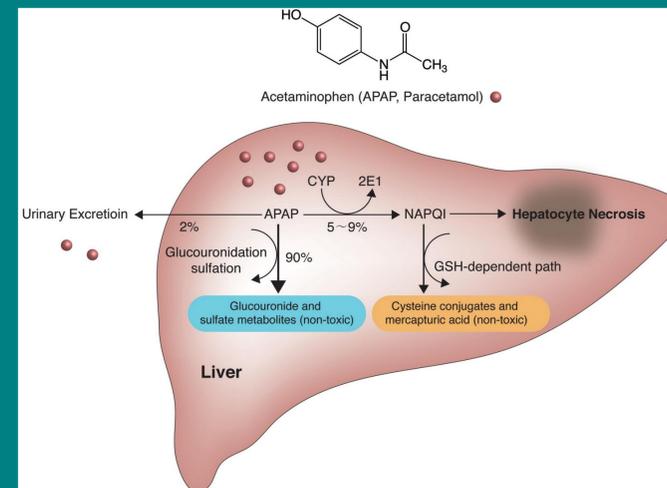
Source: <https://www.mdcalc.com/acetaminophen-overdose-nac-dosing>

Discussion

Ofirmev® is an effective and commonly administered postoperative analgesic agent. The manufacturer recommends to not exceed a maximum total daily dose of 75 mg/kg for children between the ages of 2 to 12 years old¹.

Doses in excess of 150 mg/kg/24 hours can exceed the hepatic capacity of glutathione conjugation, resulting in the accumulation of N-acetyl-p-benzoquinone imine (NAPQI) which can cause severe hepatic injury and in some cases, death².

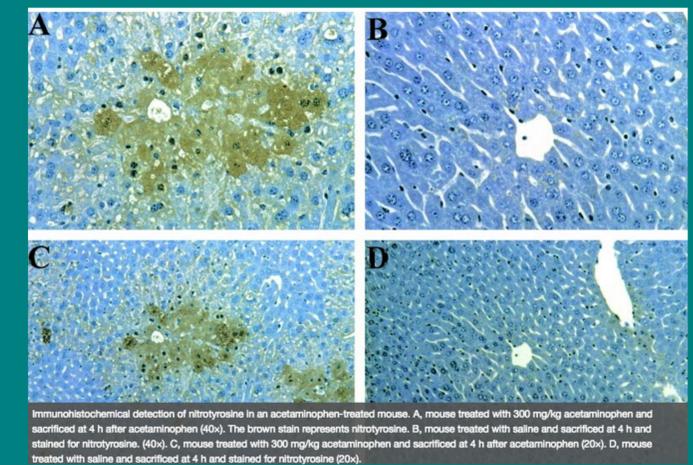
NAPQI is the toxic byproduct of CYP2E1 metabolism of acetaminophen. By one year of age, CYP2E1 expression and activity is similar to that of an adult³.



Acetaminophen metabolic pathway. E. Yoon, et al. *Journal of Clinical and Translational Hepatology* 2016; 28(4):131-42.

The decision to administer NAC should be based on laboratory data, and not given as a prophylactic measure. It might cause anaphylaxis, and an excessive dosage of NAC over a short period of time can lead to hemolysis, thrombocytopenia, acute renal failure, seizures, and finally to death. Although our patient tolerated an Ofirmev® dose that exceeded the manufacturer's recommendation, great caution should be taken with the administration of this medication in the pediatric population. Younger children can have an undiagnosed myopathy.

Acetaminophen toxicity and liver failure have been reported in patients with myopathies who have received acetaminophen doses within the therapeutic range^{4,5}.



James LP et al. Acetaminophen-induced hepatotoxicity. *Drug Metabolism and Disposition* 2003; 31(12): 1499-1506

References

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