

## Acetaminophen – Or as Rumack calls it aceta-MINE-ophen

Acetaminophen, the active ingredient in Tylenol products is an extremely common over the counter product used by countless patients in the management of pain and fever, is also a very commonly used drug in the patient who has intentionally overdosed to cause harm to him/herself.

Recently, studies have shown that a reduction in the use of 4,000 mg of acetaminophen in a 24 hour period to 3,000 mg in a 24 hour period will provide a much safer standard to decrease the potential for long term liver injury. As one is dealing with the exposed acetaminophen patient, whether there was an intent to harm one's self or not, the clinician must be aware of the possibility of the use of not only the reported acetaminophen ingestion, but also of the potential that other acetaminophen containing products may have also been ingested.

The ranges of toxicity that we follow at the Oklahoma Center for Poison and Drug Information is 200 mg/kg or a total of 10 grams – whichever comes first. One caveat is that these are only mathematical calculations and that the toxicity is based on the amount of the acetaminophen in the serum at a given time. As a treatment guideline, the Rumack-Matthew nomogram was developed to determine which patients would need antidotal therapy based on a serum level and a time of ingestion. The graph is based on a minimum of 4 hours post ingestion to a 24 hour post ingestion level. A standard treatment line runs across the graph which will help determine the need for treatment based on the unit of measurement of the serum and a time since the exposure occurred.

Part of the challenge is having to rely on the patient or the reporting person for an accurate time of ingestion. When there are elevated serum levels but no reliable time frame then the conservative approach would be to treat the patient so that the liver injury potential is minimized. Other factors to consider are elevated liver enzymes, coagulopathies, increased bilirubin levels and even elevated BUN/Creatinine levels. A standard antidotal oral dose of NAC = 140 mg/kg loading dose followed by 70 mg/kg every 4 hours x 17 doses. IV acetadote is also employed as a treatment option with a standard dose of 150 mg/kg in 200 ml D5 over an hour followed by 50 mg/kg in 500 ml D5 in 4 hours and a maintenance rate of 100 mg/kg in 1L D5 over 16 hours. If there continues to be elevations in the liver enzymes/acetaminophen levels then a consultation with a Poison Center to determine if the maintenance rate should continue until the levels are acceptable should be initiated.

As a general rule the therapy should continue until the AST/ALT levels return to less than 3x the peak number noted. Contact with the Managing Director/Medical Director should also be done if the liver enzymes remain > 1000 despite the possibility that they may have reduced 3x. While acetaminophen may be thought of by many lay people as a "safe" medication because it is purchased over the counter, the reality is that acetaminophen, while safe when used correctly, poses a host of health hazards in the overdosed patient.

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