



# The Corner

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## 28. Acetaminophen (paracetamol) poisoning in the ED

**Resident:** Good afternoon, Dr. Jones. I'd like to discuss a patient with you.

**Attending:** Go on.

**Resident:** Melissa is a 15-year-old girl with no past medical history who has been brought in by her mother because she has intentionally taken 15 1 g pills of acetaminophen two hours ago. Her physical examination is normal, without jaundice, hepatomegaly or abdominal pain. She weighs 50 kg so the dose taken is 300 mg/kg. For children older than six months the toxic dose is more than 8 grams in total, or more than 200 mg/kg, so clearly Melissa has taken a toxic dose.

**Attending:** Alright, what is your plan?

**Resident:** I've already asked the nurse to give her 1 g/kg of activated charcoal since the ingestion was two hours ago. At 4 hours after the ingestion, I'll order a complete blood test with liver and renal function, including coagulation, and acetaminophen serum concentration so we can calculate the probability of toxicity based on Rumack-Matthew nomogram.

**Attending:** Perfect. I would also page the on duty psychiatrist. Come and find me with the results.

**Resident:** Dr. Jones, I have Melissa's results. She has a normal liver and renal function, but her acetaminophen levels are 215 µg/ml. According to the Rumack-Matthew nomogram she has probable liver toxicity, so we should treat her with N-acetylcysteine.

**Attending:** OK. Would you give her the NAC orally or intravenously? And for how long?

**Resident:** I would give it to her intravenously, for 21 hours, although we have to be careful because there is a high risk of allergic reactions.

**Attending:** That's right. In our case, since Melissa is a teenager, I would start the infusion at 150 mg/kg of NAC diluted in 200 ml of 5% dextrose during one hour, then 50 mg/kg of NAC in 500 ml of 5% dextrose during four hours, and finally 100 mg/kg in 1000 ml of 5% dextrose during 16 hours. What do we have to monitor during the following hours?

**Resident:** I would monitor the development of symptoms, given that these can occur hours and even days after the ingestion.

**Attending:** Exactly, do you remember the stages of acetaminophen toxicity?

**Resident:** I've just revised them. The first stage occurs during the first 24 hours, during which the patient can remain asymptomatic or present mild symptoms such as vomiting or malaise. During the second stage up to 72 hours after the ingestion, hepatotoxicity and nephrotoxicity appear, and they peak at the third stage up to 96 hours, when multi-organ failure can develop. Finally, the fourth and last stage is the recovery phase which can take up to 2 weeks or even more.

**Attending:** So, would you repeat the blood test at any point?

**Resident:** Yes, I would do another blood test near the end of the treatment with NAC. If the patient has no symptoms, the acetaminophen concentration is undetectable and the ALT is normal, then NAC can be discontinued. Otherwise, IV NAC treatment should be continued until these conditions are met.

**Attending:** Very well. Please inform Melissa and her mother and arrange the hospital admission.

**Resident:** OK. Thank you very much Dr. Jones.

### Key words

Acetaminophen: acetaminofeno (paracetamol).

Poisoning: intoxicación.

Pills: pastillas.

Jaundice: ictericia.

Activated charcoal: carbón activado.

Liver and renal function: función hepática y renal.

Serum concentration / levels: concentración / niveles plasmáticos.

(To) page: llamar al busca.

On duty psychiatrist: psiquiatra de guardia.

N-acetylcysteine: N-acetilcisteína.

CT scan: tomografía computarizada (TC).

5% dextrose: suero glucosado al 5%.

Peak: pico.

Multi organ failure: fallo multiorgánico.

Recovery: recuperación.



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