

# Accidental staggered paracetamol overdose: An interesting case report

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## ABSTRACT

Paracetamol is one of the most commonly used drugs both over the counter and on prescription. Liquid paracetamol is available over the counter all over the world. Most commonly available concentrations are 120 mg/5 ml and 250 mg/5 ml. Many parents and healthcare professionals assume that doses available in different countries are similar. However, 500 mg/5 ml bottle is available in some countries including the United Kingdom. This leaves a potential for accidental overdose with therapeutic intent. We have reviewed the experience of diagnosing and managing an interesting case of paracetamol over dosage caused by several ingestions over 24 hours period (staggered paracetamol over dosage). It highlights the importance of communication between health professionals and parents while managing common medical problems.

**Key words:** Accidental poisoning, children, paracetamol

## INTRODUCTION

Paracetamol is one of the most commonly used drugs both over the counter and on prescription. It is used in infants and children for pain relief and as an antipyretic. Liquid paracetamol is available over the counter in the United Kingdom as 120 mg/5 ml and 250 mg/5 ml and rarely 500 mg/5 ml bottle. Many parents and healthcare professionals assume doses are 120 mg/5 ml and 250 mg/5 ml. This leaves a potential for accidental overdose with therapeutic intent, and we would like to report such a case.

## CASE REPORT

A 14-month-old toddler was referred by his General Practitioner

(GP) giving a 3-day history of vomiting and diarrhoea. The parents reported a febrile convulsion 1 week previously while in Spain, where they took the child to a secondary hospital and were prescribed paracetamol and ibuprofen four hourly, to control the fever. The child remained well and afebrile until the day before return, when he developed offensive bright yellow diarrhea with no blood or mucus. No other family members were affected. He was lethargic and was not eating or drinking. On examination he looked slightly jaundiced, had enlarged congested tonsils, and had a blanching viral rash on his arms, face, and torso. Other examination was unremarkable.

Parents told GP and pharmacist that 5 ml of paracetamol was given to child every 4 hours for the past 6 days, before the child was presented to hospital. Fortunately, parents also brought the empty paracetamol bottle with the child. When a curious medical student checked, it was discovered that the paracetamol suspension the family had obtained and used in Spain contained 500 mg/5 ml as opposed to the usual 120 mg/5 ml commonly available in the United Kingdom [Figure 1]. The Spanish hospital had prescribed the correct dose; however, there was a misunderstanding, because they were in Spanish. Therefore, the parents had been giving 500 mg every 4 hours.

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**Figure 1:** Paracetamol preparations of different strengths

This child weighed 10.4 kg; therefore he was receiving nearly 300 mg/kg/day, double the 150 mg/kg/day level for treatment advised by the NPIS.<sup>[1]</sup> This dosage continued for 6 days until 2 days before hospital admission, when 120 mg/5 ml strength paracetamol was substituted. The child was diagnosed with staggered paracetamol overdose as the child was given toxic dose of paracetamol through several doses in 24 hours time and treated with *N*-acetylcysteine, as advised by the National poisons information service(NPIS).<sup>[1]</sup> Investigations including serum paracetamol level was less than 10 µg/ml and liver function tests both aspartate aminotransferase and alanine aminotransferase were less than 50 IU/l. He was discharged 4 days later with no further problems.

## DISCUSSION

Paracetamol-induced hepatotoxicity remains a serious condition in pediatric practice.<sup>[2]</sup> Cases of paracetamol toxicity induced by multiple therapeutic or supratherapeutic doses of paracetamol have been reported.<sup>[3]</sup> The symptoms of paracetamol intoxication are nonspecific, making diagnosis and treatment of unintentional paracetamol intoxication more likely to be delayed.

Our case illustrates that good communication between health professionals and parents is of paramount importance. The GP and pharmacist were told that 5 ml of paracetamol was given every 4 hours for the past 6 days, before the child was presented to hospital. It is understandable for them to assume that this was 120 mg/4 hours. Fortunately, on closer examination of the empty paracetamol bottle brought with the child, the diagnosis of paracetamol overdose was made. There are reported cases of acute hepatic failure requiring liver transplantation in

children with the paracetamol over dosage.<sup>[2]</sup> Determination of serum paracetamol levels is useful in the management of paracetamol overdose when the time of the overdose is known with certainty. However, if the overdose is staggered over a long period, serum paracetamol tests are impossible to interpret and they can be normal. Therefore, clinician has to diagnose based on clinical history. Moreover, normal liver function tests and coagulation screening can be normal if paracetamol overdose does not affect the liver function. In our case these investigations were normal as reported in the literature.<sup>[3]</sup> Heubi *et al* reported<sup>[4]</sup> that 52% of cases of accidental pediatric overdose were erroneously given an adult preparation. This case highlights the importance of checking medications when patients return from abroad.

This problem is further increased when considering use of medicines in children as a whole. As Choonara states, many medicines are used in children off-licence.<sup>[5]</sup> This is often due to the increased costs to conduct clinical trials in children. If we are to increase the safety of medicines, then it may be necessary to look at unifying drug preparations or making parents and clinicians aware of the differences that exist.

## CONCLUSIONS

Now that travel is more commonplace and increasingly more people are being treated abroad, taking a full drug history in every patient including not only the prescribed amount but also the amount actually taken is clearly important. Finally, we need to be aware of the difficulties of communicating with patients where there is no common language. This should prevent further accidents.

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