LETTERS

A safer presentation of intravenous paracetamol is available

The risks of accidental 10-fold errors in the administration of intravenous paracetamol have been well publicised in the UK by the Medicines and Healthcare products Regulatory Agency¹ and the National Patient Safety Agency.² These errors can arise where the dose in milligrams is confused with the dose in millilitres. The risk is compounded by the presentation of intravenous paracetamol in vial sizes which exceed the required dose.

Dose volumes for children weighing less than 10 kg are less than 10 mL. Originally, the only intravenous paracetamol products licensed for children of all ages were 500 mg/50 mL bottles and 1000 mg/100 mL bottles. While these products contained the same concentration of paracetamol in mg/mL they contained doses for children weighing up to 33 kg or more than 50 kg. These bottles containing 10 or 20 times more paracetamol than required for babies were being used in our neonatal and paediatric units. There was no barrier to 10-fold error.

In 2012, as a UK Medication Safety pharmacist promoting safe medicines use in a large acute hospital, I raised concerns about the lack of availability of an intravenous paracetamol formulation suitable for small children³ especially where there was evidence of potentially harmful error.

In 2016, a product containing paracetamol 100 mg/10 mL was launched in the UK.⁴ We decided that this product should be available in our neonatal and paediatric units where, up until then, the smallest bottle size available was 500 mg/50 mL. Our paediatric intravenous paracetamol dosing guide was amended to specify the use of the 100 mg/10 mL for all children weighing less than 10 kg.

In the neonatal unit, paracetamol 500 mg/50 mL has been completely replaced by the 100 mg/10 mL formulation. There is no justification for keeping any other IV paracetamol product where the babies being treated will not weigh more than 10 kg and will never require doses of as much as 100 mg (10 mL). The total amount of intravenous paracetamol issued to the neonatal ward has reduced by 80% as a result.

In other paediatric units, 100 mg/10 mL ampoules, and 500 mg/50 mL and

1000 mg/100 mL bottles are issued for children weighing less than 10 kg, children weighing between 10 and 33 kg, and for children weighing more than 33 kg. The amount of each presentation issued in any given period of time will depend on the demographics of the children being treated. The effective reduction in overall usage of intravenous paracetamol (mg) is therefore smaller at 5%.

The switch to a safer product in this vulnerable patient group is not cost neutral as the 100 mg/10 mL ampoules are more expensive than the 500 mg/50 mL bottles. However, the increase in cost is small compared with the overall trust-wide expenditure on intravenous paracetamol. The cost of intravenous paracetamol issued to our neonatal unit over the 18-month period from April 2016 to September 2017 was approximately £3000 compared to a hospital spending on intravenous paracetamol products in the region of £79 500.

From a medication safety perspective, all organisations should be able to demonstrate that they are using the safest formulation of intravenous paracetamol to minimise the risk of wrong dose errors associated with confusion between dose and dose-volume in paediatric patients. While there may be questions about whether organisations can afford to use the 100 mg/10 mL product, the question about whether we can afford *not* to should also be asked.

Gillian F Cavell

Correspondence to Gillian F Cavell, Department of Pharmacy, King's College Hospital, Denmark Hill, London SE5 9RS, UK; gillian.cavell@nhs.net

Competing interests None declared.

Provenance and peer review Not commissioned; internally peer reviewed.

© European Association of Hospital Pharmacists (unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

To cite Cavell GF. *Eur J Hosp Pharm* 2018;**25**:233.

Published Online First 30 October 2017

Eur J Hosp Pharm 2018;**25**:233.
doi:10.1136/ejhpharm-2017-001425

REFERENCES

- 1 Medicines & Healthcare products Regulatory Agency. Risk of accidental overdose in infants and children. Parfalgan. 2010 (accessed 27 May 2010).
- 2 National Patient Safety Agency. Overdose of intravenous paracetamol in neonates and children. Signal. 2010 <http://www.nrls.npsa.nhs.uk/resources/?EntryId45=83757> (accessed 29 Oct 2010).

- 3 Cavell GF. A safer presentation of intravenous paracetamol is needed. *European Journal of Hospital Pharmacy* 2012;**19**:424.
- 4 B Braun Melsungen AG. *Paracetamol 100mg/ml solution for infusion. Information for the user*, 2015.