A review of 4,652 exposures to liquid laundry detergent capsules reported to the United Kingdom National Poisons Information Service

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Introduction

Liquid laundry detergent capsules contain concentrated detergent in a water-soluble polyvinyl alcohol membrane.

Objective

We assessed the toxicity of 4,652 liquid laundry detergent capsule exposures reported to the UK National Poisons Information Service (NPIS).

Methods

Telephone enquiries to the NPIS were analysed for the period January 2008 to December 2018. In addition, data were collected from questionnaires about exposures submitted since July 2014.

Results

4,652 exposures were analysed: 95.4% involved children aged ≤ 5 years. Overall, 37.8% patients remained asymptomatic (Poisoning Severity Score [PSS] 0), but 59.4% developed minor (PSS 1) features, 107 suffered moderate features (PSS 2), 19 were graded as severe (PSS 3) and one (elderly patient) died.

The most common features in the 127 more serious (PSS ≥ 2) cases were vomiting (n=75), stridor (n=34), CNS depression (n=22), keratitis/corneal damage (n=21), coughing (n=18), conjunctivitis (n=13), hypersalivation (n=12), foaming from the mouth (n=11) and hypoxaemia (n=11). However, the onset of respiratory features (stridor, dyspnoea, hypoxaemia, bronchospasm, pulmonary aspiration, respiratory distress and tachypnoea) were the reason for grading 56 of 127 cases as PSS ≥ 2.

Most cases (n=4,175, 89.7%) involved ingestion. Vomiting (46.5%), coughing (4.3%) and CNS depression (3.2%) were reported most commonly. Nine (0.2%) children were intubated and ventilated.

Ocular exposure occurred in 646 cases: 371 (59.8%) suffered conjunctivitis or eye irritation and 21 (3.4%) had keratitis/corneal damage, which persisted in one patient for 9 days. In children, more serious (PSS ≥ 2) features were associated with eye contact *alone* (5.5%), than other routes (p=0.004).

Dermal exposure occurred in 364 cases; 127 (35.5%) reported minor features including skin irritation, erythema, and rash.

The number of reported paediatric (≤ 5 years) exposures fell over the study period (Figure 1), though exposures declined significantly only for children aged less than 2 years (p<0.005). There was no significant difference (p=0.436) in the mean annual absolute number of more serious (PSS ≥ 2) pediatric (≤ 5 years) exposures when data for 2014-2018 were compared with 2008-2012.

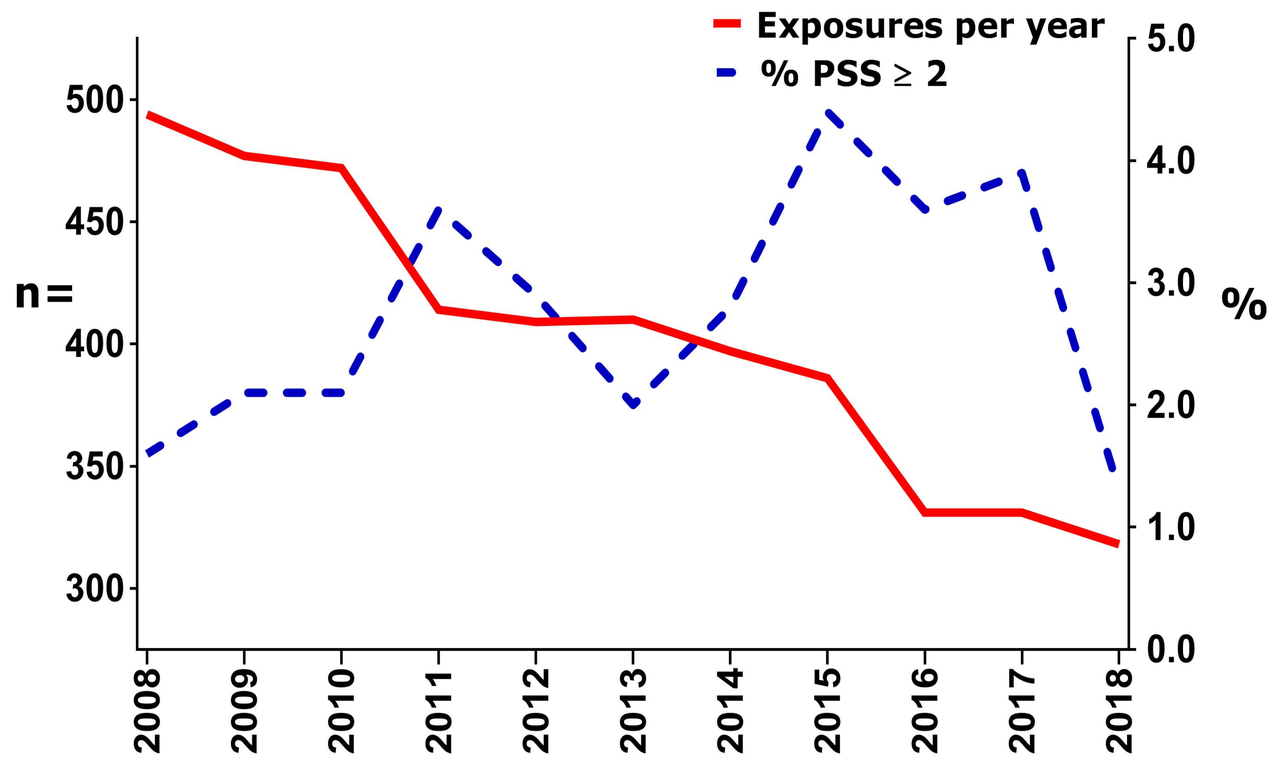

Figure 1. Number of paediatric exposures per year and percentage of more serious (PSS ≥ 2) cases.

Discussion

There are two main possibilities for the decline in the number of exposures. First, it is possible that as UK clinicians have become more familiar with these products, they have become more confident in treating cases of minor severity and have not sought specific advice by telephone from the NPIS.

Secondly, it is possible that the manufacturing changes introduced over this period, some voluntary and some regulatory (CLP of Substances and Mixtures Regulation [EC] No. 1272/2008), could have had an impact on the number and/or severity of exposures. Although the percentage of more serious cases fell in 2018, overall the lack of impact on trends in enquiry numbers normalized to sales,[1] do not provide evidence that the voluntary and regulatory manufacturing changes have had the impact anticipated.

Conclusion

Most (97.2%) exposures to liquid laundry detergent capsules caused no or only minor features. More serious (PSS ≥ 2) features developed in 127 of 4,652 cases; 44% of which were respiratory.

Declaration of interest

The UK NPIS has received unrestricted educational grants to undertake studies on the toxicity of household products from the UK Cleaning Products Industry Association (UKCPI) and Procter and Gamble.

Reference

1. Day R, et al. A review of 4,652 exposures to liquid laundry detergent capsules reported to the United Kingdom National Poisons Information Service 2008-2018. Clin Toxicol. 2019; online early: doi:10.1080/15563650. 2019.1590586