Toxicity of oven cleaners as reported to the United Kingdom National Poisons Information Service from 2009 to 2014

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Background

Oven cleaning products typically contain corrosive alkaline substances such as sodium hydroxide or potassium hydroxide (Table 1). Some products contain these chemicals in concentrations up to 30%; the pH is often greater than 12. Increasingly, these cleaners are available as aerosols or trigger sprays.

Product constituents	n	%
Contains NaOH alone	410	64
Contains KOH alone	32	5
Contains both NaOH and KOH	2	<1
Contains neither NaOH or KOH	15	2
Unknown composition	181	28

Table 1. Composition of the oven cleaners involved in this study

Objective

To investigate the toxicity of oven cleaning products as reported to the United Kingdom (UK) National Poisons Information Service (NPIS).

Methods

Telephone enquiries to the UK NPIS regarding oven cleaning products were analysed for the 6 year period from January 2009 to December 2014.

Results

There were 654 enquiries relating to 640 exposures; 122 involved children less than 5 years of age. Most exposures (90%) occurred in the home and at least 69% involved sodium hydroxide (NaOH) or potassium hydroxide (KOH) containing oven cleaners (see Table 1).

Exposures occurred from ingestion alone (n=234), skin contact alone (n=176), inhalation alone (n=80), eye contact alone (n=80) and multiple routes of exposure (n=70).

The WHO/IPCS/EC/EAPCCT Poisoning Severity Score (PSS) was known in 631 of 640 cases: 180 of 640 (29%) patients were asymptomatic [PSS 0], 428 developed minor symptoms [PSS 1] (68%), 21 developed moderate symptoms [PSS 2] (3%) and 2 had severe symptoms of toxicity [PSS 3] (0.3%).

One hundred and twelve of 234 patients ingested oven cleaner directly and 122 claimed to have ingested food 'contaminated' with oven cleaner; 54% of the former and 30% of the latter developed features of toxicity. Overall, the most common features following ingestion alone were nausea and vomiting (n=27), abdominal pain (n=17), pharyngitis (n=13) and numbness or a burning sensation in the mouth (n=12).

164 of the 176 patients exposed dermally developed features of toxicity. Symptoms included burns at the site of skin contact (n=61), localised skin reactions (n=27), tingling sensations (n=24) at the site of exposure, blistering (n=20) and skin rash (n=19).

Inhalation resulted in 73 of 77 patients developing symptoms including cough (n=23), pharyngitis (n=18) and chest pain (n=12). Eye exposure resulted in features in 66 of 78 cases, including eye pain (n=34), conjunctivitis (n=28) and eye irritation (n=20). The PSS of patients exposed via various routes is shown in Table 2.

Route of exposure	PSS 0	PSS 1	PSS 2	PSS 3	PSS NK
Ingestion (n=234)	136 (59%)	91 (39%)	3 (1%)	1 (<1%)	3
Skin contact (n=176)	11 (6%)	156 (89%)	8 (5%)	0 (0%)	1
Inhalation (n=80)	4 (5%)	67 (87%)	5 (7%)	1 (1%)	3
Eye contact (n=80)	12 (15%)	63 (81%)	3 (4%)	0 (0%)	2
Multiple (n=70)	17 (24%)	51 (73%)	2 (3%)	0 (0%)	0

Table 2. WHO/IPCS/EC/EAPCCT Poisoning Severity Score for each route of exposure

Conclusions

Most exposures to oven cleaning products, irrespective of the route of exposure, resulted in features of toxicity. These were usually mild but 4% of patients overall developed moderate or severe features of toxicity.