



Incorrect use of electronic cigarette liquid (e-liquid) as pharmaceutical eye and ear drop therapy.

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Introduction

Unlike single use disposable vape pens, refillable electronic-cigarette devices are often replenished with nicotine containing e-cigarette liquids, contained in 10-15 mL, dropper-style bottles. Given that the design and bottle sizes are similar to pharmaceutical vessels, there is a safety concern that these solutions could potentially be administered incorrectly as eye or ear drops.

Method

Retrospective analysis of enquiries received by the UK National Poisons Information Service between 1st April 2007 and 31st March 2021 relating to the incorrect administration of e-cigarette liquid into the eyes and ears was investigated. Exposure trends, demographics, clinical features and maximum poisons severity score (MAXPSS) were evaluated using descriptive statistics and Pearson's chi-squared test. An alpha of < 0.05 was considered significant.

Results

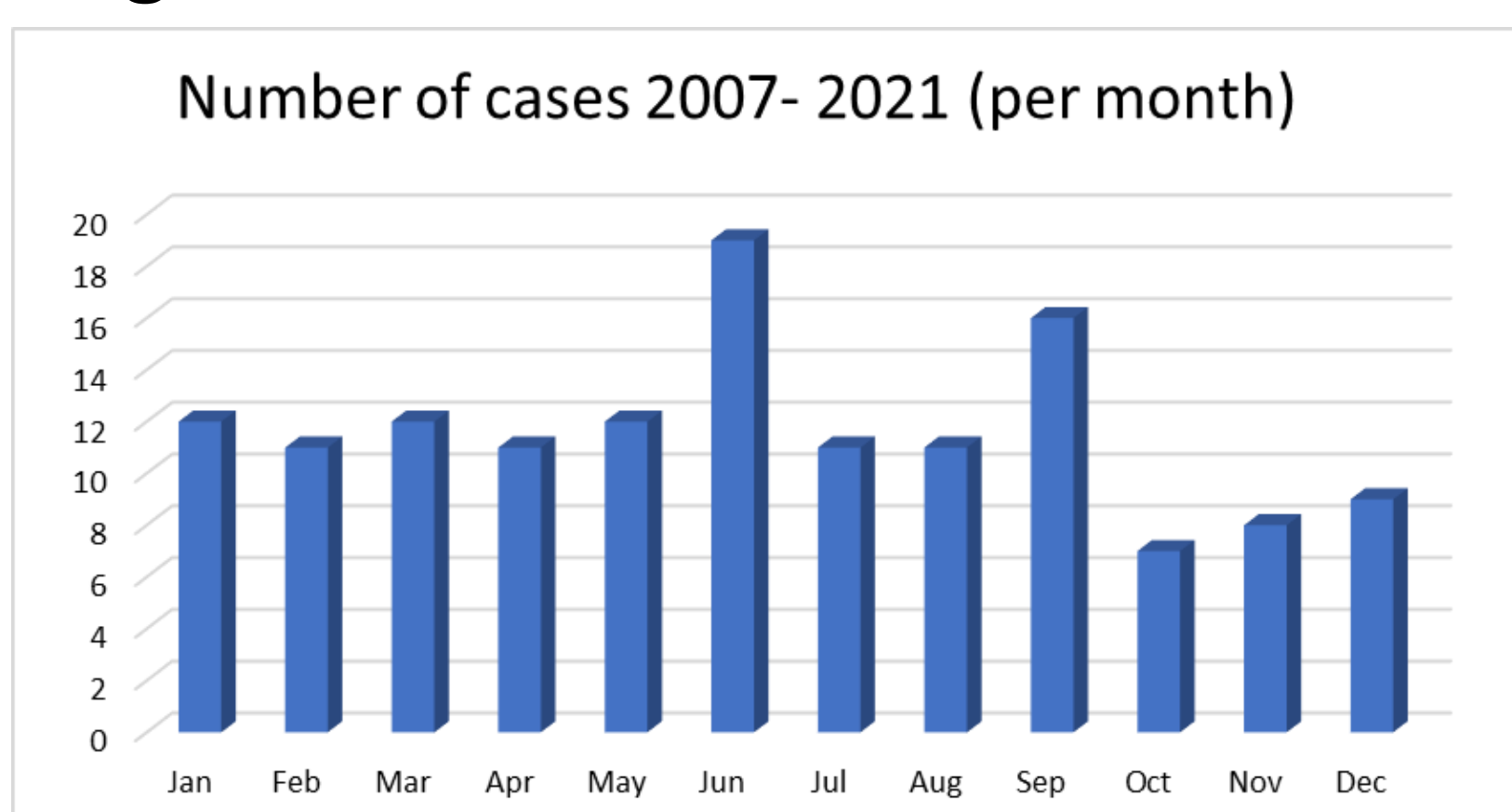
Acute, ocular exposure involving e-cigarette liquids accounted for 139 enquiries. Ear exposures totalled 36 enquiries.

Misidentification of e-cigarette liquid related to 64 ocular and 32 ear enquiries.

Misidentification by parents (n=4), mistaking for hay fever drops (n=2) and identification faults by visually impaired patients (n=2) were documented as causes for ocular administration errors. E-cigarette liquid was also inadvertently used instead of 'general' ear drops (n=16), earwax treatment (n=5), antibiotic drops (n=3), steroid drops (n=1) and olive oil (n=1).

Seventy-nine female patients administered e-cigarette liquid into their eyes compared with 60 males, p = 0.1. 50-59-year-old females and 20-29-year-old males were the most common age/gender groups for eye errors.

Figure 2:



Enquiries concerning ocular administration peaked in June (14%, n =19) and September (12%, n=16), with total average value across the years of 8% (n=11) (figure 2).

Ear drop errors occurred in 20 females and in 16 males, p =0.5. Half of all unintentional, e-liquid ear drop errors occurred in females aged 30-39-year-old (n=5) and 49-49-year-old (n=5).

Conclusion

Small, dropper-style, e-cigarette liquid bottles are commonly being mistaken for pharmaceutical eye and ear drops. Features of toxicity have occurred in some individuals following ocular and ear exposure to these liquids. A change of product design or clearer product labelling is required on vessels to ensure that future errors are avoided.

References:

[1] Figure 1: [https://commons.wikimedia.org/wiki/File:E-Cigarette_E-liquid_by_Vaping_Monkey_\(9628487175\).jpg](https://commons.wikimedia.org/wiki/File:E-Cigarette_E-liquid_by_Vaping_Monkey_(9628487175).jpg)

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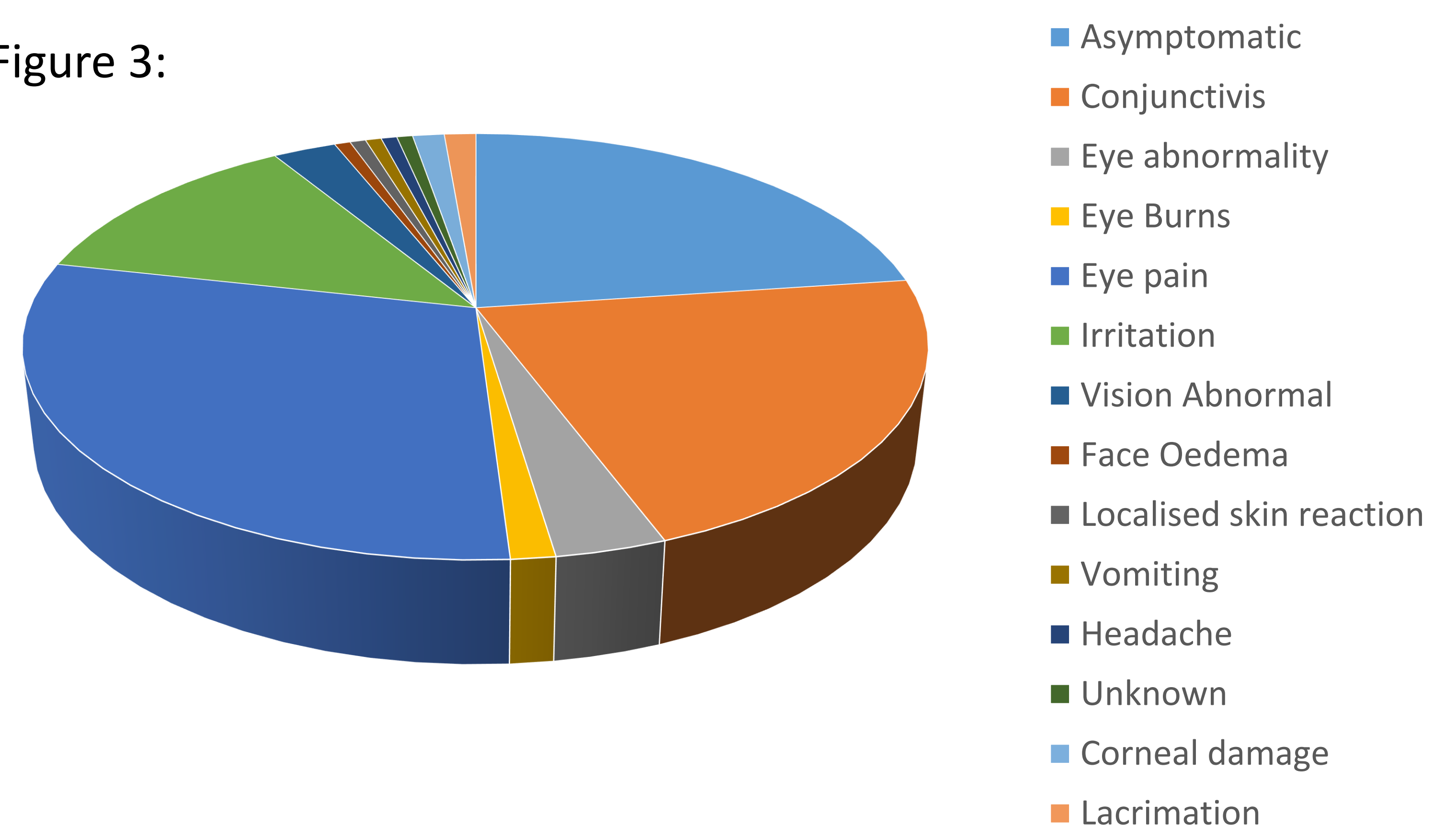
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Figure 1: E-cigarette liquid dropper bottles [1]

Following ocular instillation errors, thirty enquiries (21%) remained asymptomatic (figure 3). Reported local features included eye pain (n=44), conjunctivitis (n=32) and eye irritation (n=19). Three enquiries exhibited systemic features (headache and vomiting). One hundred cases reported at least one feature of MAXPSS 1, others presented with multiple MAXPSS1 features. Three enquiries reported MAXPSS 2.

Figure 3:



Twenty-four enquiries (67%) involving ear drop errors remained asymptomatic. Three cases reported pain, and two patients experienced dysaesthesia. Other features of toxicity included hearing loss, rash and irritation. MAXPSS0 occurred in 21 enquiries, fifteen enquiries scored MAXPSS1.