Air-Freshener Burns: A New Paradigm in Burns Etiology?

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ABSTRACT

Objectives: We report a rare case of burns following the use of automated air-fresheners.

Methods: We present a case report with a brief overview of the literature relating to burns associated with air-fresheners. The mechanism and treatment of these types of injuries are also described.

Results: A 44 year-old female was admitted under the care of the burns team following burns secondary to an exploding air-freshener canister. The patient sustained burns to the face, thorax and arms resulting in a seven-day hospital admission. The burns were treated conservatively.

Conclusions: To our knowledge this is one of the few documented cases of burns as a result of air-fresheners. As they become more ubiquitous, we anticipate the incidence of such cases to increase. As such, they pose a potential public health concern on a massive scale.

Keywords: Air-freshener, Burns, Aerosol, Public health.

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Case Report

INTRODUCTION

Air-fresheners are widely used to eliminate unpleasant or unwanted smells within a broad range of environments including cars, homes and businesses. Newer innovations by the major pharmaceutical companies have resulted in air-fresheners with automated time-outs, thereby releasing the aerosol at set time intervals and aerosols with motion sensors that release the spray on detection of movement. Although exploding aerosols, from a variety of sources, have been widely documented as causes of burns, there is little documented evidence of burns caused by exploding air-fresheners. Burns associated with exploding aerosols as well as air-fresheners contribute significant morbidity and mortality.

We report one such case of an air-freshener canister exploding causing serious flash flame burns and highlight the key public health issues. In addition, we stress the importance of taking preventative measures to avert such serious injuries.

CASE REPORT

A forty-four year old non-smoking, otherwise fit-and-well, female was referred to our burns unit with flash flame burns to her face, chest and both arms. She had no previous history of burns secondary to sun exposure or trauma.

The patient had placed an automated air-freshener replacement canister [AirWick], on a kitchen work surface in proximity (2.5m) to a lit gas cooker on low flame for 10 minutes. When she attempted to pick up the canister, which was cool to touch, it exploded causing flash flame burns to the patient as well as burning significant areas of the open-plan kitchen. The patient immediately applied cold water to the burnt areas and presented urgently to her local Accident and Emergency Department.

On admission, the patient presented with five-percent partial thickness burns (Figures 1, 2, and 3): superficial and deep partial thickness burns to both hands and forearms; superficial partial thickness burns to the face, anterior thorax and both arms. There was no inhalation injury. She was immediately referred to the regional burn unit where the burns were cleaned and dressed with appropriate burns dressings. She was admitted for monitoring and no surgical interven-

tion was required. She was discharged after seven days with outpatient follow-up.

She continues to make an excellent recovery with no complications reported.

The patient, a mother of four children one of whom witnessed their mother engulfed in flames, as well as the extended family, were severely psychologically traumatised by the incident.

Figure 1. Superficial partial thickness burns to the face

Figure 2. Superficial partial thickness burns to the right arm and shoulder

Figure 3. Superficial and deep partial thickness burns to both hands and forearms

DISCUSSION

Burns secondary to aerosol explosion have been reported in the literature.[1,2] Many common items including hairsprays, deodorants, solvents and a multitude of other devices utilize the mechanism of aerosols to discharge their key ingredients. Aerosols, a dispersion of liquid droplets into the air,[3] contain chemical propellants, usually hydrocarbon such as propane, butane and isoprane, stored in a pressurized liquid form.[4-6] These chemicals have replaced chlorofluorocarbons (CFCs) as the main propellant due to environmental concerns.[7] The ability of these flammable droplets to spread over a large area compared to their liquid equivalents, coupled with the larger surface-to-volume ratio than bulk liquids makes aerosols extremely flammable and more susceptible to causing devastating fires and explosions.[3]

In a series of 18 patients burnt by aerosol explosions over a 5-year period admitted to the burns centre, Yarborough demonstrated the serious nature of injuries sustained with 5 of the 18 requiring surgical intervention (TBSA between 5-45%).[1] There is relatively little written in the literature regarding burns secondary to air-fresheners. Marc et al., described the first fatal case of a 41-year-old female using an air-freshener aerosol to "rid her kitchen of bad smells," a not too uncommon occurrence in the domestic household.[4] Similar to the presented case, the patient had sustained burns extending to her face and neck, upper thorax and left arm. More recently, Hawkins et al. described the unique case of an automated air-freshener causing burns to the face, scalp and ears of a 53-year old smoker.[8] Although the patient made a good recovery, the case highlights important concerns regarding these novel devices.

The risk of flammability is frequently mentioned on the small print of air-freshener labels along with advice to keep the items away from sources of ignition. Although the presented patient was aware of the explosion risk of aerosols at extreme temperatures, she was not alerted to the fact that an explosion could occur whilst placing the aerosol some distance from a naked flame, in this case over 2.5 meters away.

As automated air-fresheners, delivering timed or motion-sensed aerosol releases, become more ubiquitous, there are concerns of an increase in the incidence of burns for example to smokers unaware of the location of these devices whilst visiting unfamiliar surroundings. Although high-

lighting the dangers on canisters is one step in the right direction, educating the public about preventative measures is also crucial. Air-fresheners should be kept away from sources of heat (including lit cigarettes) and strong sunlight as well as ensuring the direction of spray of such items, be they static or timed devices, is oriented away from heat sources.

There is a need for improving public awareness of the hazards of using air-fresheners both by reporting incidents, such as that involving the presented patient, in the literature as well as improving the visibility of the relevant warnings on individual products.

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