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# 155 burns caused by hair straighteners in children: A single centre's experience over 5 years



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## ABSTRACT

Hair straighteners have become a popular and common household appliance. The incidence of burns from these devices is rising, and is of particular concern given that the main casualties are infants. We present the largest case series in the literature of paediatric burns from hair straightening devices.

**Methods:** Retrospective data collection of all burns by hair straightening devices presenting to our unit between 2007 and 2011. Details on demographics, time and mechanism of injury, size and depth of injury and treatment received were recorded.

**Results:** There were 155 cases in the five-year period. The mean age was 19 months. The majority of the burns were caused by a 'touch/grab' (49%) or 'stepped-into' (14%) mechanism. The area most frequently burnt was the hand with 60% of the injuries. 8 out of the 155 required excision and grafting.

**Conclusion:** Hair straightening devices can reach temperatures of over 220 °C and can cause significant full thickness injuries. Our study shows that infants and toddlers are at most risk. These are preventable burns that warrant our attention, and we would advocate the use of heat-resistant pouches and closure clips on the devices to help minimise the risk of injury.

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## 1. Introduction

'Hair straighteners' are a hand-held, mains operated, electronic device consisting of two opposing heated metal or ceramic plates which are 'clamped' across a section of hair (Fig. 1). The hair is then drawn through the closed device, heating and thereby straightening the hair as this is done. The heated plates can reach maximum temperatures of over 220 °C, much hotter than many domestic heat sources which are commonly recognised to be a source of infant burns (Fig. 2).

The specific feature of hair straighteners that makes them such a significant burn risk to children, is the long period of time it takes for the devices to cool after use. Previous studies have shown that the heat-cooling curves of these devices demonstrate an ability to cause a burn with 1 s of contact for up to 15 min after the device has been turned off [1–3].

Over the past decade, as hair straighteners have become more popular due to commercial availability, fall in prices, and the fashion for straight hair, we have seen a steady rise in the number of children presenting to our service with burns from these devices.

## 2. Method

The South West UK Paediatric Burns Centre based at Frenchay Hospital in Bristol is one of four tertiary referral centres for paediatric burns in the UK, and covers the South West and South Central areas of England and South Wales.

We searched our departmental paediatric burns injury database and weekly MDT meeting records to identify burns caused by hair care devices in children less than 18 years of age between 1st January 2007 and 31st December 2011. 161 cases

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Fig. 1 – Hair straighteners.

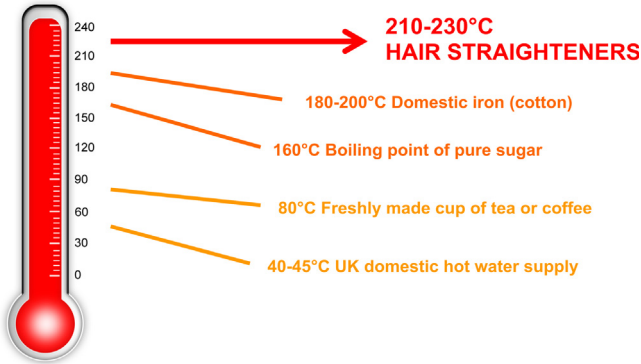


Fig. 2 – Comparative temperatures of domestic heat sources.

were identified, of which 155 were caused by hair straighteners. The six burns that were caused by other hair care devices consisted of two cases of burns from curling tongs and a burn from a heated hair brush, all of which were partial thickness finger tip burns, and three cases of mixed radiant/contact burns from hairdryers which caused larger injuries of 2–2.5% total body surface area (TBSA). These six burns were excluded from further analysis. We reviewed the case notes and database entries of the hair straightener burns, and collected details on; demographics, mechanism of injury, size and depth of injury and treatment received.

### 3. Results

During the study period the department saw 3470 new burn presentations in children, meaning that the 155 burns from hair straighteners accounted for 4.5% of all injuries seen.

Over the five years, we noted a steady increase in the number of burns from hair straightening devices, reflecting the increasing popularity, availability and affordability of the product (Fig. 3). Peak incidences of injury occurred following

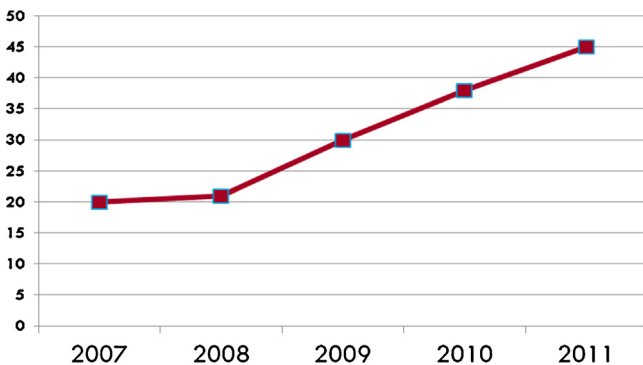


Fig. 3 – Number of injuries by year.

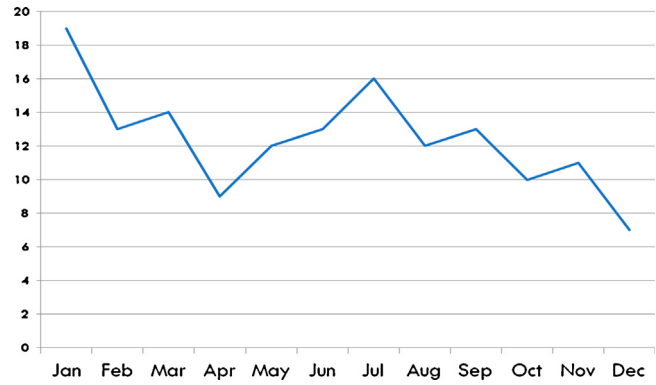


Fig. 4 – Number of injuries by month of the year.

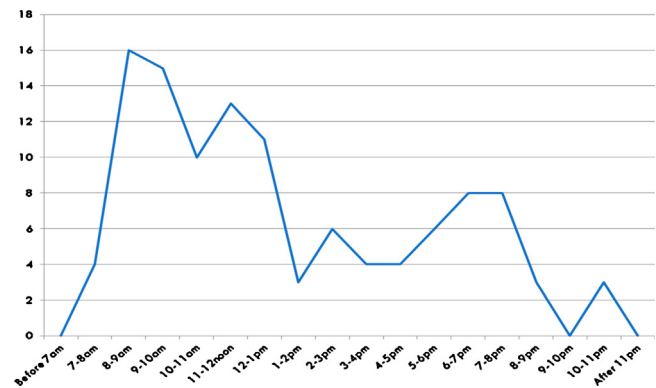


Fig. 5 – Number of injuries by time of day.

Christmas and at the beginning of summer (Fig. 4). We also noted that more than 1/3 of the injuries occurred between 8 and 11 am, with a second peak in the early evening, at times of day when the household may be more chaotic and the children inadequately supervised (Fig. 5).

The majority of the injuries, 70%, occurred in children under the age of 2, when they came into contact with hair straightening devices belonging to a sibling or parent. The mean age of injury in those under 5 years of age was 17 months for boys and 21 months for girls. The incidence overall was equal in males and females, but boys had a slightly higher incidence under the age of five. These are similar to previously reported figures [4]. A second peak is noted in teenage girls, who sustained burns from the use of their own hair straighteners (Fig. 6).

There were seven main patterns of injury which correspond to the age of the child and the mechanism of injury by developmental ability (Table 1). Only four injuries were documented to be larger than 1% total body surface area, and none greater than 2%.

The commonest mechanism of injury, accounting for 49% of presentations, was from a ‘touch or grab’ by a curious toddler, resulting in small superficial burns to the palm. The next most common injury was from stepping into or onto hot hair straighteners on the floor, accounting for 14%. The third most common mechanism was ‘cord-pull’, which is sustained when the hair straightener is left on a high surface to cool and a crawling infant or toddler pulls on the dangling cord, with the open jaws of the device allowing the hot plates to fall either side of the forearm.

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