

Preventing Paediatric Scalds: A 5 Year Descriptive Analysis, Do We Need to Change Our Approach?

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Abstract

Introduction: Scald injuries are the most common type of thermal injury in the paediatric population [1]. Despite domestic accidental scalds being so common, there is limited awareness of the frequency and severity of these injuries. Awareness of trends in paediatric scalds including age, mechanism of injury and first aid would help guide future allocations of funding for burns prevention and first aid treatment in the paediatric cohort.

Methods: We searched the IBID database for all paediatric scald injuries that attended our burns unit between January 2014-19. Age demographic, incidence, mechanism, location of the scald, and first aid data was gathered, and descriptive analysis performed.

Results: Over the five year period, on average 50% of all paediatric burns in our unit were scalds. 0-2 year old age group presented with the greatest incidence of burns (>50%) each year. 87% of all scalds took place in a private dwelling with 94% on caused by preparation or direct contact with scalding food/drink. Up to 10% of all scalds did not undergo any form of first aid.

Conclusion: As 0-2 year olds are dependants, we suggest targeting future scald prevention strategies at parents/carers of newborns during antenatal/home visitor sessions as well as utilising the department of health personal child health record with a 'first aid' section including burns prevention, first aid and how to get help. Further research is scald prevention is essential to help prevent these potentially life changing injuries.

Introduction

Scald injuries are the most common type of thermal injury in the paediatric population [1]. Despite domestic accidental scalds being so common, there is limited awareness of the frequency and severity of these injuries. Public health campaigns have acknowledged this with 'Hot water burns like fire' campaign being the last media grabbing intervention to occur in the UK in April 2010. With the average cost of an uncomplicated minor scald (<10% Total Body Surface Area (TBSA)) averaging £1850, preventing these injuries would avoid potentially life changing injuries, but also offer a significant relief of monetary burden on the NHS and should empower public health campaigns to target prevention strategies more appropriately [2]. Recent focuses on burns prevention have highlighted firework risks, whilst scalds continue to be the most common presentation to paediatric burns services [3].

We retrospectively reviewed five years data of all children (0-18 years) presenting to our burns service with scalds. We aimed to highlight the current trends in paediatric scalds identifying the commonest age group affected, mechanism of injury, and post-injury

first aid therefore allowing focussed preventative strategies to be made.

Material and Methods

We searched our regional burns unit's International Burns Injury Database (IBID) over a 5 year period between January 2014-19 for all paediatric patients (0-18 years) that sustained a 'scald' as their mechanism of injury. Data regarding age, environment in which scald sustained, scalding agent and whether first aid was given, were collected and analysed in Microsoft excel. Descriptive analysis was presented graphically in the results below.

Results

Age groups (Table 1, and figure 1)

Patients were grouped in the following: 0<2 years, 2<4 years, 4<14 years and >14 years old. The total number of patients per year ranged from the lowest in 2018 at 335 patients, the highest in 2016 at 434 patients. The mean number of scalds assessed per year was 308. The majority of scalds occurred in the 0 to 2 year group (avg. 51% of total scalds).

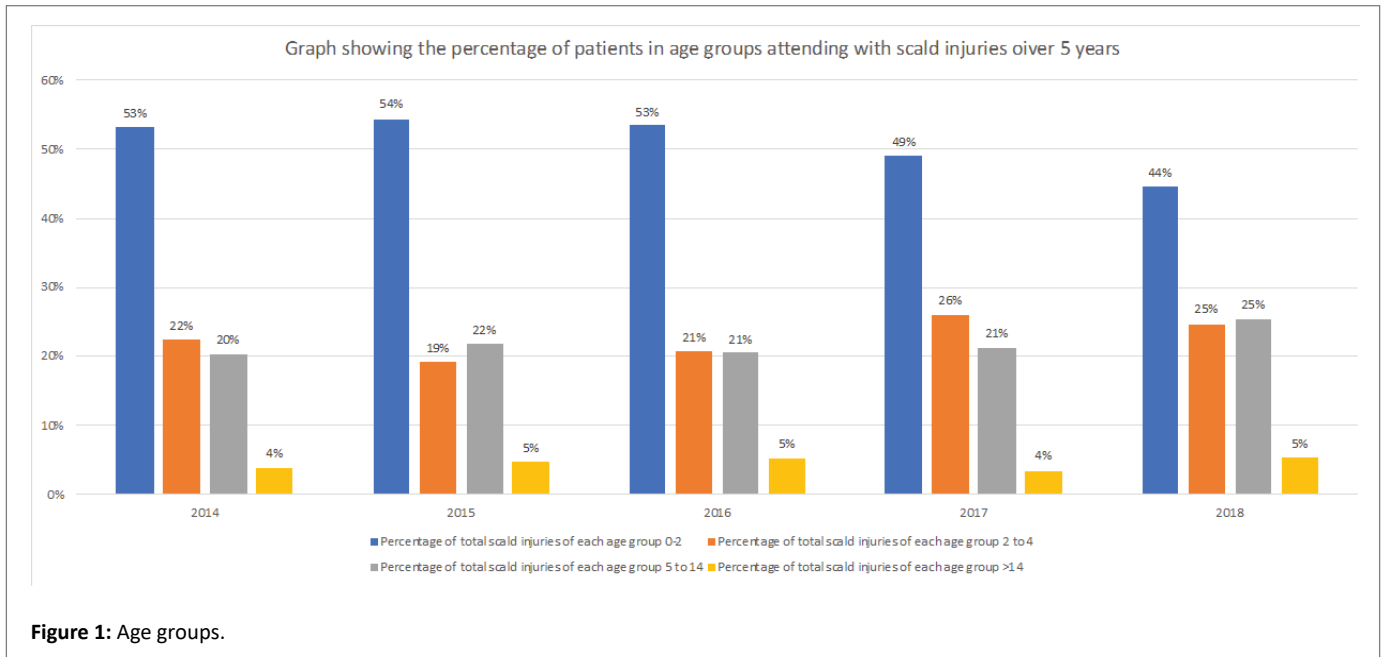


Table 1: Age groups.

Year	Total children's burns assessed	Number of scalds	Incidence of scald
2014	626	357	57%
2015	766	381	50%
2016	819	434	53%
2017	796	395	50%
2018	828	335	40%

Table 2: Table demonstrating total number of scalds in each age group by year.

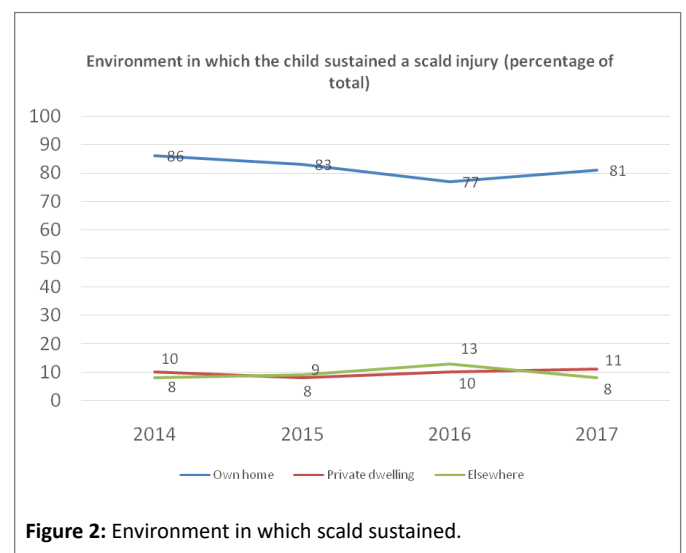
Year	0<2	2<4	4<14	>14	Total
2014	190 (53%)	80 (23%)	73 (20%)	14 (4%)	357
2015	207 (54%)	73 (19%)	83 (22%)	18 (5%)	381
2016	232 (53%)	90 (21%)	89 (21%)	23 (5%)	434
2017	194 (49%)	103 (26%)	84 (21%)	14 (4%)	395
2018	149 (44%)	83 (25%)	85 (25%)	18 (5%)	335

Environment in which scald sustained (Table 2, and figure 2)

Over the last 5 years the majority of scald injuries take place in the patients' own home (avg. 82%). The remainder of the scalds occurred in another private dwelling (avg. 8.4%) and a small percentage occurred in schools and other places (playgrounds/outdoors).

Agent causing scald (Figure 3)

Tea or coffee have been shown to cause the majority of scald injuries in our regional burn unit between 45% (2014) increasing upto 61% (2018) of all scald admissions.



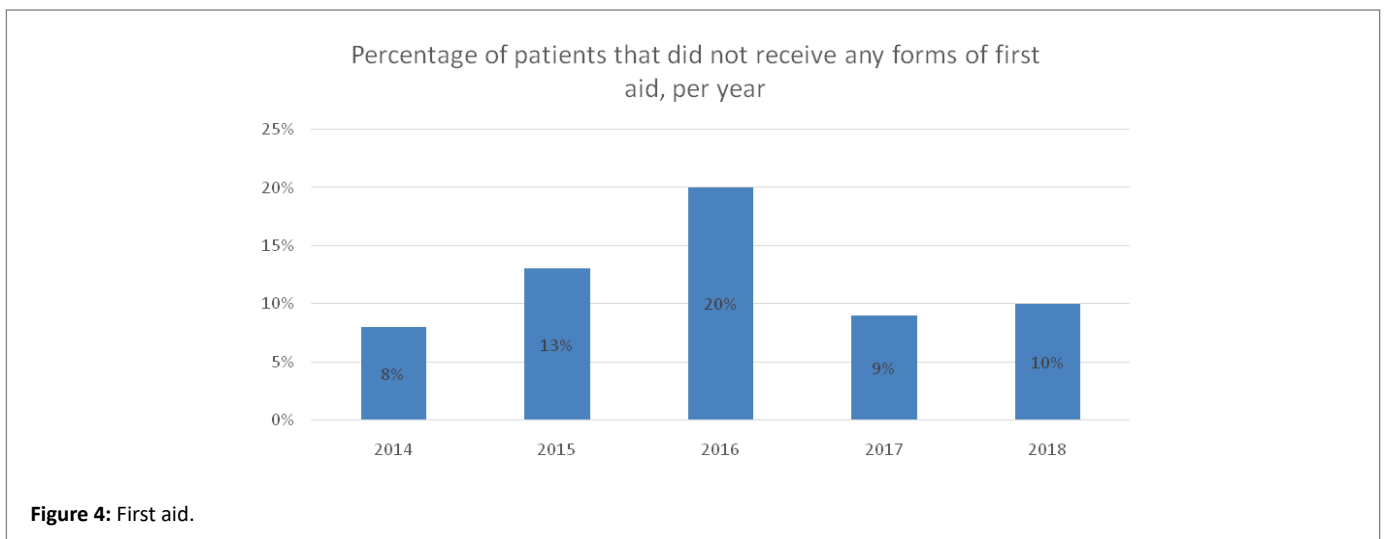
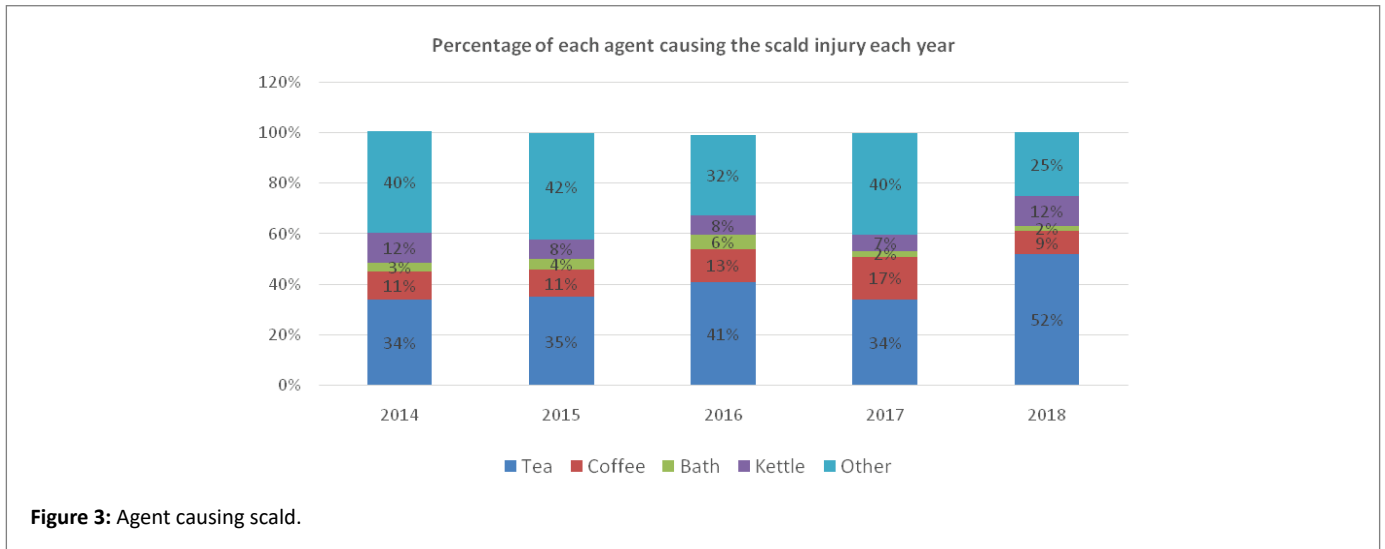
The average each year of cooking fluids, soup, milk, foods and bottles was 36%, with hot water from kettle being (9.4%). Bath water on average is the causative agent of scalds in 3.4% of cases each year.

First aid (Figure 4)

Any action to mitigate the severity of the burn was counted as first aid. On average over the 5 years, 88% of patients received some form of first aid following the injury, there was however a mean of 45 patients each year on are not receiving any form of first aid.

Discussion

Our burns service assessed a mean of 380 scalds each year and around half of those injuries were to patients aged under 2, with a fifth in each of the 2-4 and 5-14 year categories. Children under 2 years are developing hand-eye motor coordination and their primary aim is to pull items close to their face. They enjoy exploring relationships



between objects and surface properties, and may want to bang or pour things on the floor [4]. Access to hot beverages provides a ready means of sustaining scald injuries [5]. 0-2 year old children are entirely dependent on their parents/carers, with consistently highest scald incidence in this age group; we must target prevention efforts to the parents/carers of these children if we aim to reduce these numbers further.

“Hot water burns like fire” campaign ensured it was a legal requirement for all newly installed UK bath taps to have thermostatic mixing valves limited the temperature of its water to 48°C [6]. The percentage of bath scalds in our study had reduced; in 2017-18 only 2% of children had bath scalds. However, we acknowledge selection bias may be present as our unit as it does not manage large area burns (>10% TBSA) which may be more associated in bath scalds. Spallek M, et al. in Australia assessed the use of scald prevention campaigns such as ‘Hot water burns like fire’ and identified that there was no significant reduction in scald injuries following the campaign [7].

After removal of bath scalds, the remaining mechanisms including preparation or direct contact to scalding food/drink with beverages

(45-61%), kettle (2-6%), other scalding food/drink (25-40%). All these mechanisms averaged 94% of all scald mechanisms each year. 88% occurred in either the patient’s own home or another private dwelling. The health and safety executive in Ireland found 57% of scalds occurred in under 3 years old with 95% of these occurring at home [8]. The UK are not alone, Lowell G, et al. identified 90% of the scald injuries in Chicago in under 5 year olds were related to hot drinks or cooking fluids/foods [3]. Burns awareness campaigns must therefore raise awareness of the potential dangers within the household environment with a particular focus on hot food and drink around young, especially wholly dependent children.

Bennett CV, et al. published a feasibility study assessing ‘Safe-Tea’; a campaign that aimed to raise awareness of scald injuries and focussed on pre-school children in Cardiff. A multi-faceted approach, utilising printed material, activities and DVDs were used in an area of deprivation, followed up with pre-and post-intervention questionnaires along with focus groups. Although the results appeared encouraging, fewer than 50% of parents completed both pre and post- intervention questionnaires. They concluded the approach had merit but further evidence was necessary to ensure that the energy

and funding required for such a community based intervention was useful [9].

An epidemiological study in Hong Kong reported upto 50% of admitted burn patients did not have timely first aid and also demonstrated most commonly 0-2 year age group to be affected [1]. Our data has shown that upto 10% of our scald patients had no first aid prior to assessment.

Where should scald prevention be focussed based on our results?

Targeting parent/carers of the potential hazards of hot food/drink around 0-2 year old children is essential. We suggest accessing 'new' willing and engaging parents by utilising ante-natal classes and delivering information on preventing scald injuries with small group teaching/during a health visitor session should be trialled. The aim would be to highlight potential household dangers that can be avoided for these newborns.

Preventative information can be provided in the department of health, Personal Child Health Record (PCHR) 'red book' that follows a baby through its early year development. There is currently no 'first aid' section in this book, which would be very useful including a section on burns/scalds [10]. Scald prevention strategies should be directed towards children around hot food/drinks primarily ensuring they are out of reach as well as information of first aid and how to get help.

Conclusion

Under two year olds sustain over 50% incidence of all paediatric scalds with 88% occurring in a household environment. 94% of all scalds are due to either preparation or directly related to hot food/drink. 0-2 year olds are dependants and therefore we suggest accessing parents/carers in antenatal/healthcare visits as well as utilising PCHR (red book) to raise awareness of scalds as well as first aid management. Further research in this area is essential to help prevent these potentially life changing injuries.

Limitations

The limitations of this study are the reliance on the IBID database being upto date and having adequate information provided. We looked at 5 years of patient data in our regional burns unit. We believe the true incidence of scald injuries in our population may be much greater considering those managed in the urgent treatment centres and not referred to a burns service as well as those that don't seek medical help.

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