Epidemiology of burns presenting to an accident and emergency department

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INTRODUCTION

The survey was undertaken in order to review the circumstances surrounding accidents that precipitated burn injuries which, presented to an inner city accident department. Figures are available of the number of burns seen in Plastic Surgical units (Burncare Symposium, 1986), and of the number of burns occurring at home (Consumer Safety Unit, 1986), however, there is no published work documenting patients with burn injuries attending an A&E department in this country, except indirectly in articles dealing with injuries to particular regions of the body, e.g. the hand (Cutting et al., 1987), or with particular causes and types of burns (Bull et al., 1964).

METHODS

All patients attending the accident department with a burn, from whatever cause, were entered into the study. The survey began on 4 September 1987, when the department moved into its new premises and was computerized, and finished on 31 January 1988. The doctor attending a patient with a burn was asked to fill in a simple questionnaire at the time of seeing the patient. This asked for details on:

(1) age and sex;
(2) time and date of attendance;
(3) cause of burn;
(4) site of burn;
(5) whether first aid was administered at time of burn and what this was;
(6) whether referred to plastic surgeon;
(7) the place where burn occurred; and
(8) depth of burn.

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The department's computer system (Grout et al., 1989) was used to carry out a daily check to ensure that patients were not being omitted from the survey. A list of all burn attendances was checked against the completed questionnaires for the previous day. Questionnaires were completed from the information in the A&E notes for any patients who had been missed. By this method no patients with burns over the 5-month period were missed from the study.

RESULTS

A total of 196 subjects were seen with burns, during the period of the survey, out of a total of 20270 patients seen in the department (new attendances). Burns thus made up 0.96% of patients seen in the department.

The subjects comprised 89 adult males, 70 adult females, 23 boys (<16 years) and 14 girls (<16 years), see Fig. 1. The age distribution for the sexes is shown in Fig. 2. In adults there is a peak in the 20 to 30 year age group in both sexes, and the distribution between the two groups is very similar. In children there is a peak in the 1-to 5-year age group.

The time of presentation to the department is shown in Fig. 3. The peak time being around the middle of the day for adults.

Figure 4 demonstrates the proportion of burns seen in the department which were referred to a Plastic Surgeon (all these patients were seen in the local Plastics Unit, the proportion actually admitted is unavailable, but is likely to be the majority). There was virtually no difference between the adults and children, in each case only 10 and 11% being referred respectively.

Figure 5 shows the proportion in each group who received first aid at the time of the burn; this was defined as the application of water to the burn and the removal of clothes if relevant. The proportion receiving first aid in the men (55%),
women (57%) and boys (56%), is very similar. However, in the girls' group first aid was received less often than the other groups (47%). This was not, however, statistically significant because of the low number of girls (14) admitted. Of those not receiving conventional first aid, there were seven patients who had other substances applied to their burns and the break down of this is shown in Table 1.

Figure 6 shows the sites of the burns for the four groups. The hand, not sur-
Fig. 4. Patients referred.

Fig. 5. First aid received.

Table 1. Substances applied to burns

<table>
<thead>
<tr>
<th>Age years</th>
<th>Sex</th>
<th>Substance applied</th>
<th>Ethnic origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>male</td>
<td>hand cream</td>
<td>Indian</td>
</tr>
<tr>
<td>14/12</td>
<td>male</td>
<td>vaseline &amp; sugar</td>
<td>Irish</td>
</tr>
<tr>
<td>58</td>
<td>female</td>
<td>vaseline</td>
<td>British</td>
</tr>
<tr>
<td>6</td>
<td>male</td>
<td>vaseline</td>
<td>British</td>
</tr>
<tr>
<td>2</td>
<td>female</td>
<td>hand cream</td>
<td>Irish</td>
</tr>
<tr>
<td>5</td>
<td>male</td>
<td>toothpaste</td>
<td>Indian</td>
</tr>
<tr>
<td>14</td>
<td>female</td>
<td>turmeric</td>
<td>Indian</td>
</tr>
</tbody>
</table>
Surprisingly, is the most commonly burned site. In adults the upper limb, the lower limb and the face are burned most commonly. In children the face was much less often involved, but the thorax and abdomen are burned more commonly. This is probably because the child is more often involved in accidents in which they pull/spill hot fluids over themselves from a height. Figure 7 shows the cause of the burns for the four groups.

Scalding is by far the most important cause in all groups, with hot metal second. Figure 8 shows the place where the burn occurred. As can be seen from Fig. 8, in all the groups the kitchen is the most common place to receive a burn. Men are more likely to receive their burns at work (35%) as apposed to women (17%).
A higher proportion of women (50%) received their burns in the kitchen as opposed to men (35%).

Figure 9 shows the depth of the burns. It is clear that the majority of burns seen in the department are superficial (56%), with 40% being partial thickness and only 4% being full thickness. Figure 10 shows the relationship between the depth of burn and whether or not first aid was administered (the use of other substances was counted as no first aid).

Although at first sight there would appear to be differences between the groups,
less first aid being given seeming more likely to protect against increasing depth of burn, this fails to reach statistical significance. This may well be due to the small size of the full thickness burn group, which involved only eight subjects. It is interesting to note that all the full thickness burns were the result of either flame damage or contact with hot metal, both of which would seem more likely to give deep burns irrespective of first aid having been given.

**DISCUSSION**

Burns make up only a small percentage (0.96%) of the work load of St Mary’s Accident & Emergency Department, 196 patients out of a total of 20270. Of the 196 burn subjects only 20 (10.2%) required referral to a plastic surgical team. The study, therefore, demonstrates that the majority of burns seen in A&E departments are of a degree which do not require referral and are dealt with entirely by A&E staff. This is also reflected by the fact that only 4% of burns seen were diagnosed initially as full thickness. The return rate of patients during the period of the study was 14%. It is the policy of this Accident & Emergency Department to return patients to the community for dressings. Therefore it was not possible to correlate the first aid required to the length of time for which the burn required dressings, rather, first aid was correlated with the depth of burn (Fig. 10).

The kitchen is the most common place to receive a burn. Men are more likely to receive their burns at work (35%), as apposed to women (17%). This is, however, likely to be due to the fact that a higher proportion of men work (i.e. paid employment). Likewise a higher proportion of women (50%) received their burns in the kitchen as apposed to men (35%). Nearly all burns in children occurred in the
home, only one (2.7%) occurring out of doors, and this was due to a firework. This finding is not surprising, as the child is likely to be exposed to many more heat sources in the home than outside; also the study took place over the winter months, when children are more likely to be indoors, due to colder temperatures and longer hours of darkness.

An interesting finding of the study is that of the poor level of first aid received by patients with burns. Overall only 54% received appropriate first aid of the application of cool water. It is likely that a proportion of the injuries were received where first aid treatment with water to the affected part, was not possible; however, more than 70% of the injuries were sustained in the home, where first aid, i.e. water, should be available. There were seven patients, all but one of whom, were children who had received first aid treatment from other substances which are potentially harmful. It would, therefore, seem that health education in the first aid treatment for burns is required.

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