A STUDY OF BURNS IN CHILDREN

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SUMMARY. A retrospective study was made of burns in children admitted to a burns centre in India over a 5-yr period (1999-2003). Of the total number of 2364 burn patients admitted during this period, 222 were children (9.4%). Of these, 134 cases whose records were available were analysed for age, sex, site of injury, causes, place of accident, mortality, etc.: 131 out of the 134 cases were accidental, two suicidal, and one homicidal. Scalds are commonest (65 cases = 49%), followed by flames. Forty-seven children died (35.1%) and 65 survived (48.5%); there were 22 cases of self-discharge. Mortality was directly proportional to percentage TBSA burn: of the 28 patients with more than 50% TBSA burns, 26 (92.8%) died.

Introduction

Burn injuries constitute a major health problem and are next only to road traffic accidents as the leading cause of death in children in India. Even after great advances in management and treatment, they constitute a serious accident in children. There are many complications after burns, even when there is no life-threatening problem. There are functional and aesthetic consequences, although these may be only temporary. A study of burns in children in a particular place can pave the way for prevention of burns in children in that area.

Patients and methods

In this retrospective study we considered 134 patients treated between January 1999 and December 2003 in our burns unit. The patients came from various places, including the districts of Sangli, Kolhapur, Satara, Belgaum, Ratnagiri, and others. Information regarding age, sex, site of injury, place and time of accident, extent of burn, place of burn, time between injury and hospital admission, mortality, complications, result at time of discharge, and days of hospital stay was recorded.

Results

Out of the 2364 patients admitted with burns during the 5-yr period, 222 were children (9.4%). Of these, 134 cases had available records that could be analysed. The annual distribution of these patients is shown in Table I. Of the 134 children, 65 (48.5%) were male and 69 (51.5%) female. There were 63 patients aged 1-4 yr, 25 aged 5-8 yr, 30 aged 9-11 yr, and 16 aged 12-14 yr (Table II). In the 0-4 yr group, males were more numerous, while in the 9-14 yr group females were more numerous. One hundred and twenty-five burns occurred at home (93.2%) and nine out in the open (6.8%).

In 131 patients, the burns were accidental; one patient was the victim of a homicide attempt, and two had attempted suicide. The causes of burns were scalds (65 cases = 48.5%), flame (56 = 41.8%), and others (13 = 9.7%). The majority of burns (108 = 80.5%) occurred between 6 a.m. and 10 p.m., i.e. cooking time, and the rest (26 = 19.5%) between 10 p.m. and 6 a.m. Seventy-nine patients (59%) arrived in hospital within 6 h of the burn, 15 (11%) in the following 6 h, and the remainder after 12 h. One hundred and sixteen patients (86.5%) had mixed burns and 18 superficial (13.5%). Burns covered 10-40% TBSA in 95 patients (71%), and 36 had over 40% burns. The chest and abdomen were involved in 98 patients (73%), the upper limb in 100 (75%), the lower limb in 90 (67%), the head, face, and neck in 71 (53%), the back in 70 (52%), and the perineum in 25 (19%).

Sixty-five patients survived (48.5%) and 47 (35.1%) died. Twenty-two took self-discharge and the outcome was not known. Of the 47 children who died, 18 were males (38.3%), and 29 females (61.7%). The 0-4 yr group had a death rate of 49%, the 5-8 yr group had 9 deaths (19%), and among children aged 9 yr and over there were 15 deaths (32%). As TBSA increased, so did mortality: 3 patients out of 29 (10.3%) died in the 10-20% burns group, 5 out of 20 in the 30-40% group (25.0%), 7 out of 8 in the 40-50% group (87.5%), and 26 out of 28 in the over 50% group (92.8%). Nineteen children died in the first 24 h (40.4%), 2 in 24-48 h (4.2%), 17 in 2-15 days (36.2%), and 9 after over 15 days (19.2%). Fifteen children died owing to dehydration (32.6%), 7 to respiratory distress (15.4%), and 24 to septicemia (51.1%). The organisms grown in wound swab cultures were coagulase-negative Staphylococcus (20), Pseudomonas (7), Proteus (5), coagulase-positive Staphylococcus (4), Klebsiella (2), E. coli (2), and Citrobacter (2). The wounds were treated with honey dressings. Hospital stay was longer in survivors, with an average period of around two weeks. In fatal cases, hospital stay was less than seven days in the majority of patients. Eight out of the 65 children who survived needed split-thickness skin graft, while 57 healed without.
yr age group, males accounted for 52.3% of the cases and females 47.7%. This difference may be due to the greater activity of male children in this age group. Females dominated in the 4-14 yr age group because of the custom of unsupervised cooking by young females in rural India, the use of unsafe pressure stoves, and fire-related domestic activities. 4-93.2% of the burns occurred in the home, where most time is spent.

Scalds accounted for 48.5% of the cases, followed by flame burns (41.8%), which is similar to the rate reported by Amico et al.5 The mortality rate in this study was 35.1% and the survival rate 48.5%; the remainder discharged themselves, with unknown outcome.

Mortality was directly proportional to the percentage of TBSA burned. Twenty-six out of 28 patients with burns in over 50% TBSA died. Most deaths occurred on the first day of admission because of dehydration and respiratory distress, suggesting the need of prompt and aggressive fluid resuscitation in children without any delay after admission. Septicaemia was the cause of death in the children who died later, mainly because of the growing incidence of multidrug-resistant bacteria, which is commonly seen in burn patients, the patients’ lack of isolation, and the inadequate supply of higher antibiotics for resistant bacteria. Honey was used as a local dressing for the wound, a recent study having indicated that honey is helpful in controlling wound infection.

**Discussion**

Burns in childhood are frequent in everyday life and are among the severest of all pathologies in children. The functional and aesthetic consequences after treatment, in addition to their being life-threatening traumas, necessitate efforts for burn prevention in children.

In this study, the admission rate for children in the age group 0-14 yr was 9.4%, which is lower than the incidence of 25.2% reported by Gupta et al.2 and similar to that reported by Subrahmanyam.3 The pre-school age group (0-4 yr) accounted for 47% of the patients. Pre-school children are at higher risk owing to the greater amount of time spent at home, parental negligence, a lower level of awareness, and their inability to protect themselves. In the 0-4 yr age group, males accounted for 52.3% of the cases and females 47.7%. This difference may be due to the greater activity of male children in this age group. Females dominated in the 4-14 yr age group because of the custom of unsupervised cooking by young females in rural India, the use of unsafe pressure stoves, and fire-related domestic activities. 4-93.2% of the burns occurred in the home, where most time is spent.

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**Conclusion**

We see burns as a major preventable health problem in children. This objective can be achieved by educating parents with regard to the prevention of burns in children.

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**Table I - Annual distribution of children with burns**

<table>
<thead>
<tr>
<th>Year</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>23</td>
<td>21</td>
<td>44</td>
</tr>
<tr>
<td>2000-2001</td>
<td>12</td>
<td>15</td>
<td>27</td>
</tr>
<tr>
<td>2001-2002</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>2002-2003</td>
<td>8</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>2003-2004</td>
<td>12</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>65</td>
<td>69</td>
<td>134</td>
</tr>
</tbody>
</table>

**Table II - Age and sex of the 134 burned children**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4 yr</td>
<td>33 (52.4)</td>
<td>30 (47.6%)</td>
</tr>
<tr>
<td>5-8 yr</td>
<td>12 (48.0%)</td>
<td>13 (52.0%)</td>
</tr>
<tr>
<td>9-11 yr</td>
<td>13 (43.3%)</td>
<td>17 (56.7%)</td>
</tr>
<tr>
<td>12-14 yr</td>
<td>7 (43.8%)</td>
<td>9 (56.2%)</td>
</tr>
</tbody>
</table>

**BIBLIOGRAPHY**


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