INTRODUCTION

Burn injuries, a unique form of trauma which is sometimes avoidable, are categorized among the most severe injuries an individual can experience. Burns represent a major health problem worldwide, with high mortality and morbidity, and economic loss, even with small burns. Causes, types and incidence of burns vary from one community to another and are influenced by age, sex, economic status, local customs and social and environmental circumstances. Numerous papers discussing the various aspects of burn injuries are being published worldwide, but little work has been done in Pakistan. The treatment of burn patients in a specialized facility is of inestimable worth. Burn injuries represent a serious public problem, with children and young adults being the main victims. As most of these injuries would have been avoidable, it is of utmost importance to have accurate collection and analysis of data from different regions of the country to spotlight the differences in etiology, morbidity and mortality and to indicate the methods used by the most successful facilities, as it appears that burn injuries in Pakistan are not adequately studied. The accurately collected and analyzed information would help to establish a national program of burn prevention.

MATERIAL AND METHODS

This is a retrospective study of all burn injury cases admitted to Khyber Teaching Hospital from January 2002 to December, 2008. Most patients were admitted through accident and emergency department. The medical records of all patients were reviewed including, age, sex, date of admission and discharge, type, cause, place, and mode of injury, extent of burn areas affected, morbidity and mortality; and surgical procedures performed. The inclusion criteria was patients of both sexes with age range of 1-50 years, those patients who suffered burn injuries at home and at work. The data was recorded on preformed proforma and the approval of ethical committee was taken. The estimation of the extent of burn was done by the consultant surgeon. Acute burn cases treated as outpatient and cases admitted for treatment of post burn contractures were excluded: The information obtained was tabulated and analyzed. Student’s t-test was used where applicable to determine statistical differences and a P value of <0.05 was considered to be significant.

RESULTS

A total of 270 patients were admitted during the period studied. There were 138(51.1%) males and 132(48.8%) females with a male to female ratio of 1.04:1. Children up to age 10 accounting for the main victims (36.2%), Table 1. Scalds (mostly from hot water and tea) were the main injuries sustained (44.07%), followed by flame burns (40%). Among 109
flame burn cases, there were 40 cases of gas cylinder accidents, 21 burns due to flammable liquids and 16 cases caused by wood stoves. The remaining flame burns were due to other causes. The types of burns were scalds, flames, electric, chemical and miscellaneous. Approximately 87% of all burns were domestic. Burn accidents at work were seen in 26 cases (9.6%, all were male). Four cases of intended burns were encountered (Three homicidal and one suicidal). The remaining 266 patients were injured accidentally, either by their own actions or as innocent bystanders. A slight insignificant seasonal variation in the frequency of burns was observed, with high incidence in winter (28.5%) and spring (27.8%) and fewer occurrences in summer (23.8%) and autumn (19.9%). The extent of the burns Total Burn Surface Area (TBSA) ranged from 1% to 90% (mean 15.23%). More than half (51.2%) of the cases were burns of 10% or less. Thirty patients (11.1%) sustained burns of more than 30% TBSA. The mean extent of flame burns was significantly higher than that of scalds; P < 0.01. Third-degree burns occurred in 65 cases (24%). The upper limbs were involved in 66.8%, followed by lower limbs (49.1%), head and neck regions (48.4%) and trunk (44%). Genital and perineal areas were the least affected (9%). Length of hospital stay ranged from one day to 140 days. The mean hospital stay for flame burns was significantly higher than that for scalds; P < 0.01. Most of the patients (56.5%) stayed in hospital for less than two weeks. Fifty patients (18.5%) required more than one month in hospital and 67 patients (24.8%) stayed between 10 and 30 days. Twenty-eight patients (10.3%) were discharged against medical advice. Seventy-eight patients (28.8%) needed surgical intervention (excision and grafting). Surgery was carried out for 70 patients (28.8%) needing surgical intervention was quite high in the hospital rather than estimating their total incidence in the community. It is considered that the sample is representative of the pattern in the area. The general sex distribution (male to female ratio of 1.04:1) is comparable with that reported by others.7,8 However, males were more affected than females above 20 years of age (ratio of 3.5:1), which is equal to the figures reported by Greens et al.9 Exceptedly, there were more females than males (ratio of 2.5:1) in the 11-30-year age group. There is nothing surprising about the age of burn cases in this series. Children up to 10 years of age were the main victims (36.2%), which agrees with report by Reig A. et al.10 Such high incidence of burns among children is probably due to large families in the community, and the fact that a lot of time is spent at home. The present report showed that the majority of burns admitted to hospital occurred at home, with the most common type being scalds in children and flame burns among adults. These observations are not new and are consistent with those reported by others.11,12,13 Gas cylinder accidents featured in 38.5% of flame burns, reflecting the careless handling of this commonly used cooking facility. Others showed similar observation.14 It is worth mentioning that wood, commonly used for heating was responsible for flame burns in about 15% of cases. This is because those heaters are designed to be installed at floor level, within easy reach of toddlers and children. Electric and chemical burns constituted 12.9% of the cases, whereas they were less in other reports.12,13 Burns at work occurred predominantly among expatriates from low socioeconomic status working as manual or semi-skilled workers. A high incidence of burns among the lower socioeconomic class has been alluded to by some authors. Length of hospitalization and mortality are usually used for describing the outcome. We agree with others that these parameters are not adequate, and more objective and subjective parameters are necessary to determine the late outcome. The number of cases requiring surgical intervention was quite high in comparison to the reports from other burn units of Pakistan. The number of patients requiring amputation was also alarming. The mortality of burn injuries varies widely, from 1% to 52%, depending on several factors, such as the nature of the study population, the burn facility concerned, and the policy of admission. Our mortality rate of 2.8% was quite low.

**Table 1: Distribution of patient according to age and sex**

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>55</td>
<td>43</td>
<td>98 (36.2%)</td>
</tr>
<tr>
<td>11-20</td>
<td>16</td>
<td>21</td>
<td>37 (13.7%)</td>
</tr>
<tr>
<td>21-30</td>
<td>23</td>
<td>48</td>
<td>71 (26.2%)</td>
</tr>
<tr>
<td>31-40</td>
<td>20</td>
<td>7</td>
<td>27 (10%)</td>
</tr>
<tr>
<td>41-50</td>
<td>8</td>
<td>3</td>
<td>11 (4.07%)</td>
</tr>
<tr>
<td>&gt;50</td>
<td>16</td>
<td>10</td>
<td>26 (9.6%)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The information available from KTH, Peshawar on the burn injuries has been drawn from burn facilities. The present report, in contrast, was based on a retrospective review of medical records of the burn cases admitted to the general surgical wards at KTH, Peshawar. Our study was carried out with the objective of describing the patterns of burns in the hospital rather than estimating their total incidence in the community. It is considered that the sample is representative of the pattern in the area. The general sex distribution (male to female ratio of 1.04:1) is comparable with that reported by others.7,8 However, males were more affected than females above 20 years of age (ratio of 3.5:1), which is equal to the figures reported by Greens et al.9 Exceptedly, there were more females than males (ratio of 2.5:1) in the 11-30-year age group. There is nothing surprising about the age of burn cases in this series. Children up to 10 years of age were the main victims (36.2%), which agrees with report by Reig A. et al.10 Such high incidence of burns among children is probably due to large families in the community, and the fact that a lot of time is spent at home. The present report showed that the majority of burns admitted to hospital occurred at home, with the most common type being scalds in children and flame burns among adults. These observations are not new and are consistent with those reported by others.11,12,13 Gas cylinder accidents featured in 38.5% of flame burns, reflecting the careless handling of this commonly used cooking facility. Others showed similar observation14. It is worth mentioning that wood, commonly used for heating was responsible for flame burns in about 15% of cases. This is because those heaters are designed to be installed at floor level, within easy reach of toddlers and children. Electric and chemical burns constituted 12.9% of the cases, whereas they were less in other reports.12,13 Burns at work occurred predominantly among expatriates from low socioeconomic status working as manual or semi-skilled workers. A high incidence of burns among the lower socioeconomic class has been alluded to by some authors. Length of hospitalization and mortality are usually used for describing the outcome. We agree with others that these parameters are not adequate, and more objective and subjective parameters are necessary to determine the late outcome. The number of cases requiring surgical intervention was quite high in comparison to the reports from other burn units of Pakistan. The number of patients requiring amputation was also alarming. The mortality of burn injuries varies widely, from 1% to 52%, depending on several factors, such as the nature of the study population, the burn facility concerned, and the policy of admission. Our mortality rate of 2.8% was quite low.
Compared with that of other studies. The low mortality of this series could be due to the dominance of young patients, and minor and moderate burns, which carry very low mortality. Among massive burns of more than 30% TBSA, the mortality was quite high, eight out of 29 cases (27.6%), compared to that reported in other series. Based on the unacceptable figures of outcome, we strongly recommend referral of major burn cases to a proper burn center in order to offer the best management.

CONCLUSION

An intensive educational program is needed to increase public awareness of burn dangers and to teach the proper prevention and safety measures at home and work/school.

REFERENCES

7. Al-Bunyan AR. The Burn Unit at Riyadh Central Hospital- Prototype for a Burn Unit in MOH Hospitals, 1982. Proceedings of the 7th Saudi Medical meeting. 3- 6.5. 1982. Damman.

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