Egyptian Journal of Forensic Sciences (2012) 2, 117–122

Contents lists available at SciVerse ScienceDirect

Egyptian Journal of Forensic Sciences

journal homepage: www.ejfs.org

ORIGINAL ARTICLE

Fatal burn injuries: A five year retrospective autopsy study in Cairo city, Egypt

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Received 4 March 2012; revised 11 August 2012; accepted 15 August 2012
Available online 6 October 2012

KEYWORDS

Burn deaths;
Flame burns;
Neurogenic shock;
Septicemia;
TBSA;
Egypt

Abstract Burn deaths are an important public health problem in a developing country like Egypt. The purpose of this study was to record and evaluate the causes and the magnitude of the fatal burn injuries retrospectively. An analysis of autopsy records revealed 106 (2.66%) cases of burn injuries among the total autopsies done over 5 years period (2006–2010) in the mortuary of Forensic Medicine Institute, Cairo. The majority of deaths (66.1%) occurred between 11 and 50 years of age group with a preponderance of males (67%). The flame burns were seen in 96.2% of the victims. The majority of burn incidents were accidental (55.7%) in nature followed by suicidal (22.6%) and homicidal (21.7%) deaths. The percentages of burns (TBSA) over 50% were observed in most of the cases (83%). Clear signs of vitality were found in 67% of the victims. The majority of deaths occurred within a week (82%) and most of the victims died from neurogenic shock (54.7%) followed by Septicemia & pneumonia (23.5%). The results of this study provide the necessary information to develop proper burn prevention programs, thereby reducing the frequency of burns and burn-related deaths.

1. Introduction

Injuries are an increasingly recognized public health problem, substantially affecting nearly every population and every geographical zone in the world. Burns have always been considered as one of the most destructive injuries, causing not only deaths but also major economic and psychological impacts and long-term somatic sequelae as well[1,2] burn injury is a common type of traumatic injury, causing considerable morbidity and mortality. Moreover, burns are also among the most expensive traumatic injuries, because of long hospitalization and rehabilitation, and costly wound and scar treatment.[3,4]

Burns are injuries produced by application of dry heat such as flame, radiant heat or some heated solid substance like metal or glass to the body. Local injury to the body by heat may result from dry heat, application of hot bodies, licking by flames resulting in simple burns, moist heat leading to scalds, and corrosive poisons resulting in corrosive burns. Electric

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Peer review under responsibility of Forensic Medicine Authority.

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http://dx.doi.org/10.1016/j.ejfs.2012.08.002

spark, discharges, flashes and lightening leads to electric burns.[5]

Burns are an important cause of injury to young children, being the third most frequent cause of injury resulting in death behind motor vehicle accidents and drowning. Burn injuries account for the greatest length of stay of all hospital admissions for injuries.[6] According to the World Health Organization, 238,000 individuals died of fire-related burns in 2000, and 95% of these deaths occurred in low and middle-income countries.[7,8] The approach to burn prevention, to be effective in a particular area, should be based on a sound knowledge of etiological patterns of burn injuries and must take into account the geographical variations and socioeconomic differences in burn epidemiology.[9,10]

As in other low income countries, burns in Egypt are considered as major health problems that are associated with high mortality and morbidity. Cairo, the capital of Egypt, is one of the most crowded cities in the world. The population of Greater Cairo, according to the most recently published statistics is 18.5 million inhabitants.[11]

A number of studies on various aspects of burns have been reported from various parts of Egypt, but there is lack of information especially on fatal victims from the great Cairo. The Present study is based on a 5 years retrospective study (2006–2010) of fatal burn cases at autopsy from Zeinhom Morgue of Forensic Medicine Institute, Cairo. The aim of this study was to record and evaluate the causes and the magnitude of the fatal burn injuries retrospectively.

2. Subjects and methods

A retrospective study was done on burn deaths from Cairo Governorates which were autopsied according to attorney request at Zeinhom Morgue of Forensic Medicine Institute. Of the 3981 autopsies performed on all types of unnatural deaths between 1st January 2006 and 31st December 2010, 107 (2.69%) were the cases of burns. These 107 fatal burn cases form the material of this study. A medico-legal autopsy is mandatory in Egypt for all unnatural deaths including those due to burns irrespective of the burns being accidental, suicidal or homicidal. An in-depth examination of the epidemiological features and medicolegal aspects of these 107 burn deaths was performed in an effort to more clearly understand the dynamics surrounding these deaths. Retrospective data were collected from the autopsy reports of the Institute, case sheets from the hospital, the general prosecutor's investigations report and the inquest reports from police. All the records revealed various information pertaining to their age, sex, Accident location, Type of burn, Manner of death, TBSA (estimated according to Lund–Browder chart), Duration of survive, Signs of vitality, COHB% and Cause of death. Data were presented as numbers and percentages by using SPSS version 10. Pearson correlation coefficient was done and P value is considered significant at < 0.05.

3. Results

Among 3981 cases of total autopsy done, only 106 (2.66%) were the victims of burns showing no definite ascending or descending time trend. Similarly there was no definite mortality trend as well seeing the total burn admission and burn death.

3.1. Demographics

The age and sex distribution is given in Table 1. In burn deaths, 67% of the victims were male and 33% were female with Male: Female ratio equal to 2:1. The age of victims ranges from 1 to 75 years. 66.1% of the burn victims were between the ages of 11–50 years with peak incidence at 31–40 years (21.7%). minimal number of cases were observed in the extreme age groups outside 5–70 years.

3.2. Seasonal & diurnal variation

Table 2 shows the seasonal variations in burn deaths. The highest proportion occurred in winter (41.5%), followed by summer (24.5%), then autumn and spring (17% for each). Regarding variations in burn injury with time of day, the incidence is high in night (53.8%) more than day (46.2%).

3.3. Accident location

Table 3 shows the commonest location for burn deaths was home locations (82.1%), followed by work locations (10.4%) and a small percentage in outdoor locations (7.5%).

3.4. Manner of burning

Distribution of the manner of burning is shown in Table 4. Accidental burning was observed in 55.7% followed by suicidal (22.6%) and homicidal burning (21.7%). Suicide cases are common in female (15.1%) while accidental is common in male (7.5%).

3.5. Causes & types of burns

Table 5 shows the overwhelming majority of the victims (96.2%) sustained flame burns. Analysis of mode of flame burn injuries revealed that (68.9%) burns were due to fire, pouring of benzene over body (17%), pouring of kerosene over body & Kerosene burner (10.4%). Three victims (3.8%) died from electrocution. There were no scalds or chemical burns in this series.

3.6. Burn percentage (TBSA)

Fig. 1 shows 83% of the 106 victims sustained more than 50% of total body surface area (TBSA) burns. Table 7 illustrates the relation between percentage of TBSB and Duration of survive. There was a positive correlation between the mean percentage of TBSB in both children and Duration of survive.

3.7. Duration of survive

The majority of deaths (82%) due to burns occurred within a week of the incident. During this period the maximum number of deaths occurred within 6 h (65.1%) 3.8% of deaths occurred in more than 2 weeks post-injury period as shown in Fig. 2.

3.8. Signs of vitality & COHB%

Data shown in Table 6 & Fig. 4 declared that the large majority (65%) of the 106 victims who died from burn, signs of vitality (soot in airways and/or digestive tract) were found at