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Burns in Kosovo: Epidemiological and therapeutic aspects of burns treated in University Clinical Center of Kosovo during the period 2003–2012

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ABSTRACT

Background: Burns in Kosovo are a major cause of injury and which demand very high economic and social costs. The aim of this study is to describe the epidemiological and therapeutic aspects of burn patients treated in the Department of Plastic Surgery and in the Intensive Care Unit in Pristina, Kosovo. **Methods:** We retrospectively analyzed all patients treated in the Department of Plastic Surgery and in the Intensive Care Unit during the period 2003–2012.

Results: Of the 1412 burn patients admitted from 2003 to 2012, 133 patients with a large burned surface area were treated in the ICU, and the other 1279 patients were treated in the Department of Plastic Surgery. Of all patients, 66.6% (941) were male and 33.4% (471) were female, with an average age of 41.5 years, ranging from 1 to 83 years old. According to age, we found that most cases were children, respectively, 52.9% (747) cases, while adults were 47.1% (665) cases. The present age-group was 0–5 in 41.8% of cases, while other age-groups rarely. Of all patients treated in our department, only 19.3% (272) were treated surgically, the rest, 76.3% (1077) were treated conservatively. During this ten-year study period, 2.6% (37) patients died (in the intensive care unit died 27.8%). From the analysis of the deceased patients, it was found that 64.9% (24) were male, and 35.1% (13) were female; 54% (20) were children, and 46% (17) were adults.

Conclusions: In Kosovo, high-risk groups are children up to five (1–5) years and men. The data suggest that the incineration injuries are more frequent and they could be reduced by improving the socio-economic level of the population and creating preventive strategies.

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1. Introduction

Despite many medical advances, burns continue to be a challenging problem due to lack of infrastructure and trained professionals as well as increased costs of treatment, which have an impact on the outcome [1]. Incineration damages are a serious pathology, potentially with severe morbidity and significant mortality, but also has a significant health-economic impact [2]. They can be caused by heat, electricity, chemical agents and radiation.

Burns are still a major cause of morbidity and mortality in developing countries, such as Kosovo. Approximately 90% of burns occur in under developed countries, which generally lack the necessary infrastructure to reduce the incidence and severity of burns [3]. Also they have a relatively high economic and social costs in every country. The differences between the populations with burn

injury will also be related to differences in the standard of living and economy [4]. It is quite that the mortality in the developed world in burns is reduced significantly due to better and timely management [5–7]. 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 [8].

Kosovo is a new country in the western part of the Balkan, South Eastern Europe, with a population of approximately 1.8 million people, where the majority of people are young. Kosovo enters in the group of the poor countries of Europe, with the low level of economic development, with a high level of unemployment (about 30%), and with high level of extreme poverty (12%). Also, most of the population lives in rural areas, but after the war (1998–1999) there has been a great influx of population movement towards urban areas. This the low level of socio-economic development of Kosovo, makes its population far more vulnerable to burns. The University Clinical Center of Kosovo, as a tertiary institution, and all regional hospitals (secondary institutions) and Family Medicine

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Centers (primary institutions) are funded by the Ministry of Health of Kosovo, with an annual budget of 80 million Euros. Kosovo still does not possess the Burn Centers, and the Clinic of Plastic Surgery is the only tertiary referral center for the treatment of patients with burns. Therefore, patients with a major percentage of TBSA area are usually sent for further treatment in other European countries. For transferring abroad severe burns patients, the Ministry of Health pays 70% of the monetary amount required by a foreign medical institution (maximum 20 thousand euros), while the rest is paid by the patient. Therefore, only the patient is sent abroad who are able to pay 30% or more of the monetary amount required by hospitals outside of Kosovo. For the absolute majority of these patients we have not had any knowledge about the course or the end of their treatment, since their family members do not report to us.

Generally, gender, age, burn surface area, presence of inhalation injury, co-morbid disease, co-existing trauma, and pneumonia are considered mortality risk factors of burn patients [9,10]. Burn patients die for three main reasons; burn shock during the first few hours after injury, respiratory failure in the following days, and septic complications and organ failures during the subsequent weeks which are common among pediatric patients [11].

2. Materials and methods

This 10-years study includes all data reporting on etiology, incidence, prevalence, and outcomes of burns in Kosovo. In this retrospective study 1412 patients were included with burn injury. All these patients were treated in the Department of Plastic Surgery and Intensive Care Unit in Pristina during the time period 2003–2012. Data was processed from admissions protocols to University Clinical Center of Kosovo. In this analysis do not include the outpatients (ambulatory).

From retrospective data analysis in this study, the following data were collected: 1) basic data: study period, distribution on years, country, retrospectively gathered data; 2) patients characteristics: number of treated patients with burns, gender, age, age-group, anatomic regions, total burned surface area (TBSA); 3) causes: the main cause of the burn injury were reported in the following six groups: flames/explosion (including fireworks), scalds/steam (including burns by warm food and oil), contact burns, electrical burns, chemical burns and burns caused by radioactivity (Radio dermatitis); 4) forms of treatment (conservatively or surgically) and mortality.

All patients with burns were initially presented for treatment in the Emergency Center. At being visited and treated by plastic surgeon, they are issued for ambulatory treatment, or are transferred for further treatment to the Department of Plastic Surgery and Intensive Care Unit.

Patients with mild burns, children up to 5% and adults up to 10%, have been issued for ambulatory treatment.

Patients with moderately severe burns, children over 5% and adults over 10%, facial burns, hand, foot, major joints, genitals, electrical burns and chemical burns, were transferred and treated in the Department of Plastic Surgery.

Patients with severe burns injury, children over 20% and adults over 30%, as well as inhalation burns, were transferred for further treatment in Intensive Care Unit. Treatment of severe burns is done in this unit because Kosovo does not possess a Burn Care Center. So the Intensive Care Unit is the General Unit, since it has treated except patients with severe burns also patients with severe cardiovascular, neurological and general surgery disease.

For the initial resuscitation of our patients the sol. Ringer, the Parkland formula is used, while for children except this formula an addition is used. Patient with deeper burns were treated surgi-

cally, necrectomy and skin grafting in the third day of removal. For covering skin defects after necrectomy, we used a skin graft from the patients themselves, an auto-graft. While in severe burns to cover skin defects, due to lack of a Skin Center, we have used skin homograft. Usually, to cover the wounds of children, skin homograft is mostly taken by parents, while for adults skin homograft is taken from brothers or sisters of the patient.

For data processing is a used statistical package in Stat 3. Presentation of these data is done through tables and figures. From statistical parameters the structural index and the arithmetic mean are calculated.

3. Results

From the analysis of patients with burns it has been noted over the years that the largest number of patients was in 2003, in 2006 and so on (Table 1). Fortunately, are found a decrease in the number of patients with burns over the years, especially in the recent years of our analysis, as seen in Fig. 1. The annual median of patients treated in our clinic was 506 patients, while the annual average of patients with burns 141.5 patients or 28.3%.

In this period of ten years, 1412 patients were treated with burns. From this total number, 133 patients with large burned surface area, with severe burns, were treated in the ICU, and others, 1279, were treated in the Department of Plastic Surgery. The patients treated in the ICU, after an improvement of the general condition, crossing state of shock, 68 patients were transferred to the Department of Plastic Surgery, for further treatment, 28 patients were transferred abroad, more severe cases, abroad in other Europe countries, and 37 died (Table 2). Of all these patients 66.6% were males, and 33.4% females, with an average age of 42, ranging from 1 to 83 years. Depending on the age, we found that the largest number of cases were children (0–15 years old) in 52.9%, while adults in 47.1%. The present age-group was 0–5 in 41.8% of cases, and other age-groups were rare. After the children, the largest number is between 21 and 60 years with 31.0% of productive age, such as shown in (Table 3). Of all patients with burns 56% are affected at the head, 23.7% at the neck, 43.6% at the trunk, 79% at the upper limbs, 43.2% at the lower limbs, 0.5% at the mamma, 3.3% at the genitalia, and 7.7% in the gluteus region (Table 4).

Causes of burns in Kosovo were numerous and different. Of these cases, 24.9% of the patients suffered from flames, including 4 cases of fireworks (explosions), 153 patients by petroleum and oil flames, and 81 by gas flames; 54% by steam scalding, 4.2% by contact with hot objects; 16% by electricity (176 patients by electricity flame and 49 patients by electricity contact); 0.9% were chemical burns (all suffered from acid) and 0.1% due to radioactiv-

Table 1

Distribution in years of burn patients in the total of all patients treated in Department of Plastic Surgery.

Years	Total nr. of patients	Burn patients	
		N	%
2003	445	171	38.4
2004	552	154	27.9
2005	542	152	28.0
2006	487	155	31.8
2007	495	137	27.7
2008	543	139	25.6
2009	492	127	25.8
2010	354	112	31.6
2011	545	142	26.1
2012	615	126	20.5
Total	5070	1412	27.9
Mean ± SD	507.0 ± 71.2	141.5 ± 17.2	28.3 ± 4.8

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