

INHALATION INJURY IN BURN PATIENTS ADMITTED TO ICU IN BURN AND PLASTIC SURGERY HOSPITAL DURING 2015 AND 2016

Munir Abdulmoula
Specialist of Plastic Surgery-Misurata Cancer Center

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ABSTRACT

Inhalation injury has now become the most frequent cause of death in burn patients. Although mortality from smoke inhalation alone is low (0–11%), smoke inhalation in combination with cutaneous burns is fatal in 30 to 90 percent of patients. It has been recently reported that the presence of inhalation injury increases burns mortality rate. Identify incidence and epidemiological features of inhalation injury among fire burned patients and analysis of the outcome of our management. Retrospective study of all patients admitted to ICU burn in Burn and Plastic Surgery Hospital, Tripoli-Libya with inhalation injury from January 2015 to December 2016. Total number of admitted patients to ICU was 293, out of them 161 (55%) sustained inhalation injury, 126 (78%) patients out of 161 patients were male gender, 138 (86%) patients out of 161 were more than 15 y old in age, 70% of non-survived patients group were with inhalation injury. High incidence of inhalation injury among patients with fire burn who admitted to ICU, Inhalation injury increase mortality by 20%, Inhalation injury had occurred more frequently in adult male gender, Bad prognosis in inhalational injured patients complicated by infection and septicemia, Early diagnosis and intubations decline mortality and morbidity rate.

KEYWORDS: Smoke inhalation, Burns, Early intubation.

INTRODUCTION

In developing countries incidence of inhalational injury is increasing because of rise in fire disaster, and Mortality from pulmonary injury are increasing⁽¹⁾. Diagnosis not always straight forward because of lacking of sensitive tests and symptoms may be delayed up to 24-36 hour post burn^(1,2).

The prognosis of fire victims usually is determined by many factors including extent and duration of smoke exposure, chemical composition of the smoke, size and depth of body surface burns, temperature of gases inhaled, age (prognosis worsens in the very young and old) and preexisting health status^(3,4).

AIM OF THE STUDY

- 1- Identify incidence and epidemiological features of inhalation injury among fire burned patients
- 2- Analysis of outcome of our management

METHOD AND MATERIALS

This research is retrospective study of all patients admitted to ICU burn in Burn and Plastic Surgery Hospital, Tripoli-Libya (which is the only specialized hospital in Libya for treating burn injury victims) with inhalation injury from January 2015 to December 2016, (Age, sex, burn surface, complication, management, length of stay and outcomes are included).

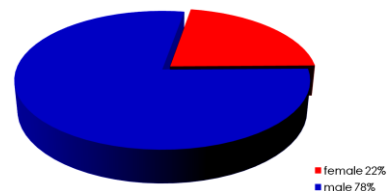
RESULTS

- Total no. of admitted patients to ICU was 293, out of them 161 patients sustained inhalation injury. (table1)

(Table 1) Percentage of admitted pt. with inhalation injury

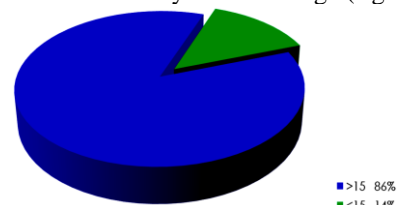
Total number of admitted patients. 293 (45%)	Total number of patients with inhalation injury. 161 (5%)
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- Male gender in Inhalation injury patients group was 126 patients that represents 78% (figure 1).



(Figure 1) Shows gender percentage among inhalation injured patients.

In Inhalation injury patients group, 138 (86%) out of them was more than 15 years old in age (figure2).



(Figure 2) Shows age distribution of admitted patients with inhalation injury.

- Total mortality rate in burn ICU was 100 patients (34%) (table 2).

(Table 2) Mortality rate among burn ICU patients.

Total number of admitted patients. 293	Total number of non-survived patients 100(34%)
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- Seventy percent of non-survived patients group were with inhalation injury (table3).

(Table 3) Shows percentage of non-survived patients with inhalation injury among non-survived patients in burn ICU.

Total no of non-survived patients 100 (100%)	Total no. of non-survived patients with inhalation injury 70 (70%)
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The mortality rate in the two groups of patients (with inhalation and without inhalation) was shown in (table 4).

(Table 4) Shows mortality rate in patient's groups with and without inhalation injury

Total number of patients without inhalation injury. 132. ↓↓↓	Total number of patients with inhalation injury. 161. ↓↓↓
Total number of non-survived patients without inhalation injury. 30 (23%)	Total number of non-survived patients with inhalation injury. 70 (43%)

The mean percentage of burn surface in non-survived patients. When associated with inhalation injury was lower than who have no inhalational injury (table 5).

(Table 5) Shows the mean percentage of burn surface in non-survived patients.

The mean percentage of burn surface of non-survived patients (without inhalation injury) ↓	The mean percentage of burn surface of non-survived patients (with inhalation injury) ↓
52% TBSA	40% TBSA

- In comparison between two groups, survived and non-survived of the patients with inhalational injury in terms of infection, time of intubation and length of stay were found, septicemia and pneumonia seen more frequently in non-survived group, also the time of intubation was delayed in this group, where the mean of length of stay in hospital was 45 days in survived group (table 6).

(Table 6) Shows comparison between 2 groups, survived and non-survived of the patients with inhalational injury.

Parameter	Survived		Non-survived	
	Female	Male	Female	Male
Sex	43%	57%	23%	77%
percentage	38 %	TBSA	40 %	TBSA
Septicemia	75 %		90 %	
pneumonia	48 %		65 %	
Time of intubation	1 st 24 hours		3 rd day	
Length of stay	45 days		9 days	

DISCUSSION

High incidence of inhalation injury among the cases admitted to ICU burn because of fire accident which represent more than 50%^(5,6), that lead to high mortality rate (70%) of total expired cases⁽⁷⁾.

The main value of the burn surface in non-survived patients with inhalation in the present study was found less than those who had no inhalation injury supported the earlier studies that the inhalation injury was main prognostic factors^(7,8,9). The difference between the survived and non-survived male patients was found to

be more than 50% sustained that the inhalation injury was more in male patients⁽⁹⁾ as reported earlier.

Inhalation injury complicated by septicemia and pneumonia which occurred more frequently in non-survived patients, which reveal bad prognosis in inhalational injury⁽¹⁰⁾.

The mean time of intubation in the survived patients was within 1st 24-hour post-burn and in non-survived patients were at 3rd day post – burn, maybe due to delay in symptoms and difficulty in diagnosis, so we consider the early intubation is live saving^(11,12).

In non-survived patients the mean duration of stay in ICU before death was nine days post burn (can be considered critical time for inhalation injured patient?) and in survived patient was 45 days.

Another factor that may be play important role in the prognosis of inhalation injury like extent and duration of smoke exposure, chemical composition of the smoke, temperature of gases inhaled, and preexisting health status of the patients that need more investigations.

CONCLUSION

- Inhalation injury increase mortality by 20%⁽⁷⁾.
- The inhalation injury had occurred more frequently in adult male gender because of outdoor accident^(7,8).
- Septicemia and pneumonia are bad prognostic signs in inhalation injured patients.
- Early diagnosis of inhalational injury and early intubations of highly suspicious of inhalational injury in burned patients decline mortality & morbidity rate^(11,12).

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